Online ISSN 1308-531X

Turkish Journal of Family Practice

Volume 29 | Issue 1 | March 2025

Published by Turkish Association of Family Physicians
www.turkjfampract.org

Turkish Journal of Family Practice

Volume **29** | *Issue* **1** | *March* **2025**

Online ISSN 1308-531X

Turkish Journal of Family Practice

Official abbreviation: Turk J Fam Pract

ISSN (Online): 1308-531X

DOI Prefix: 10.54308

Owner
Owner on behalf of the Turkish Association of Family Physicians
Prof. Dr. Güzin Zeren Öztürk (President)

Publication Type
International peer-reviewed journal

Publication Frequency and Language
Quarterly (March, June, September, December), English

Abstracting and Indexing
Turkish Journal of Family Practice is abstracted and indexed in TR-Index, EBSCOhost, Gale OneFile, Academindex.

Editor in Chief
Prof. Dr. Güzin Zeren Öztürk
Department of Family Medicine, Şişli Hamidiye Etfal Training and Research Hospital, İstanbul, Türkiye
guzin_zeren@hotmail.com - https://orcid.org/0000-0001-7730-2929

Publisher
Turkish Association of Family Physicians

Publisher Address
Hacettepe Mah. Talatpaşa Bulvarı No: 113/15, 06230, Altındağ/Ankara, Türkiye
Phone: +90 530 642 92 43
E-mail: tahud@tahud.org.tr
Web: www.tahud.org.tr

Publishing Services
Akdema Informatics and Publishing
Address: Kızılay Mah. Gazi Mustafa Kemal Bulvarı No: 23/8 06420 Çankaya/Ankara, Türkiye
Certificate number: 52576
E-mail: bilgi@akdema.com
Tel: +90 533 166 80 80
Web: www.akdema.com

You can reach all publication policies and author guidelines from www.turkjfampract.org

Editorial Board

Table of Contents

Research Articles

Review

Letter to the Editor

News

Turk J Fam Pract 2025;29(1):1-9
DOI: 10.54308/TJFP.2025.824

Research Article

An intervention study to increase knowledge of cervical cancer, HPV and HPV vaccines among family health workers

Bahadır Yazıcıoğlu[1], İrem Melike Yazıcıoğlu[2], Elif Özkaya[3], Muhammet Ali Oruç[4]

[1]Department of Family Medicine, Samsun Training and Research Hospital, Samsun, Türkiye
[2]Department of Pathology, Samsun Training and Research Hospital, Samsun, Türkiye
[3]Department of Public Health, Cancer Unit, Samsun Provincial Health Directorate, Samsun, Türkiye
[4]Department of Family Medicine, Faculty of Medicine, Samsun University, Samsun, Türkiye

ABSTRACT

Objective: The aim of this study was to assess the knowledge and attitudes of family health workers about cervical cancer, HPV infection and HPV vaccines, and to evaluate the impact of an educational intervention on these conditions.

Methods: This was an educational intervention study. Data were collected on the knowledge levels and attitudes of family health workers in Samsun province about cervical cancer, HPV infection and HPV vaccines through a pretest-posttest intervention. Data were collected using a structured questionnaire and participants received a two-hour training session. After the training, the effectiveness of the educational intervention was assessed by applying the questionnaire again.

Results: Before the educational intervention, only 57.9% reported having adequate knowledge about HPV. After the educational intervention, a statistically significant increase in knowledge about HPV and HPV vaccines was observed. It was also observed that the educational intervention had a positive effect on participants' tendency to seek HPV vaccination for themselves and their children. It was observed that the level of knowledge of family health workers about HPV screening and risk factors was relatively high, but there were deficiencies in HPV vaccines.

Conclusion: This study found that family health workers had inadequate knowledge about cervical cancer, HPV and HPV vaccines, and that the educational intervention was effective in increasing family health workers' knowledge about HPV and vaccines.

Keywords: primary nursing care, education, cancer of cervix, HPV vaccines

Introduction

Cervical cancer is a highly prevalent cancer among women and a major cause of mortality and morbidity worldwide. It is the fourth most common malignancy in women worldwide.[1] According to the Turkey Health Statistics Yearbook - 2022, cervical cancer ranks tenth among female cancers in Turkey.[2] Human papillomavirus (HPV) infection is known to be an important causative

✉ Bahadır Yazıcıoğlu ▪ bahadiryazicioglu@gmail.com
Received: 19.09.2024 **Accepted:** 26.12.2024 **Published:** 26.03.2025

factor.[1] HPV is a small virus containing a double-stranded, non-enveloped DNA genome.[3] Other factors such as smoking, immunosuppression, poor sexual health and lack of participation in screening are also known.[4]

HPV causes many infections, particularly ano-genital infections. While low-risk HPV types cause condyloma, high-risk types can cause cancers of the vagina, vulva, cervix, penis, anus, head and neck.[5] HPV infection is most common in sexually active women in their 20s. More than 140 types of HPV have been identified. Of the identified HPV types, 40 are known to be sexually transmitted. The two types with the highest risk of cervical cancer are the HPV16 and HPV18 subtypes. The HPV6 and HPV11 subtypes are mostly responsible for genital warts.[6] Because the infection is often destroyed by the human immune system, it is silent and asymptomatic. However, if chronic infections are not properly recognized and treated, disease progression and differentiation may become inevitable.[7] The time from HPV infection to cervical cancer is usually 10-20 years or more, so there is ample time for screening and early detection.[1] HPV vaccines effectively reduce the risk of cervical cancer. Despite the availability of effective screening programs and vaccines to control HPV infection, the high incidence of cervical cancer and HPV infection in women is a cause for concern.[3]

HPV vaccination is primary prevention against infection and related diseases, and HPV screening is secondary prevention against HPV.[7] There are three types of vaccine (2-valent, 4-valent and 9-valent) with proven safety and efficacy against HPV. All three types of HPV vaccine are available in Turkey, but the vaccine is not covered by general health insurance. There is also no national vaccination program.[5]

Low individual awareness and lack of knowledge about the vaccine, some negative beliefs (myths) related to the fact that the vaccine is related to the reproductive system, communication problems during counselling about sexual problems, and economic reasons negatively affect HPV vaccination.[8] As prevention and early diagnosis methods are very effective and there is enough time for diagnosis, it is important to recommend these methods to people. It is known that the level of knowledge and attitudes of people who are offered screening and vaccination influence their participation in these recommendations.[9] For a vaccination that is not covered by general health insurance and is not included in a national vaccination program, the knowledge and attitudes of health professionals, especially primary health care workers, on this issue become important. The aim of this study is to determine and increase the knowledge of primary health care workers about HPV vaccines and to raise awareness in order to positively change vaccination behavior in the future.

Material and Method

Study design and setting

This is an educational intervention study with a matched samples design. A pretest-posttest design was used to evaluate the effectiveness of the training.

Study population and sample

The study population consisted of 422 family health workers working in 449 family health units in family health centers in Samsun province. It was planned to include the entire study population in the study. Therefore, no sampling was done. However, those who could not be present at their workplaces or who refused to participate in the study during the data collection and training process were excluded from the study. As a result, a total of 393 family health workers were included in the study.

Ethical consent

This study was conducted in accordance with the tenets of the Declaration of Helsinki on ethical behavior in human research. Before the start of the study, the study protocol was approved by the Ethics Committee for Clinical Research of Samsun University on 15.02.23 with the number SÜKAEK-2023 3/5.

Data collection instruments

A structured self-administered questionnaire was used to assess the level of knowledge of family health workers about cervical cancer, HPV infection and HPV vaccines.[1-5,7,8] The final version of the questionnaire was developed in consultation with family medicine specialists, public health specialists and experts in cancer screening and infectious diseases working in Samsun Provincial Health Directorate.

The questionnaire has two main parts

Sociodemographic characteristics: This section asked about the participants' age, gender, educational status, years of professional and family health center experience, and whether they had a son or daughter. Information was collected on their level of knowledge about HPV infection and vaccines, their HPV vaccination status, and their decision to have their children vaccinated against HPV.

Assessment of knowledge and attitudes: In this section, 29 true or false choice questions were designed to assess participants' basic knowledge of cervical cancer epidemiology, risk factors, symptoms and prevention strategies, including HPV vaccination.

The questionnaire was pilot tested on a small sample of family health workers (n = 20) to ensure clarity, comprehensibility and content validity. As there were no changes that needed to be made to the feedback received during the pilot testing phase, the pilot test sample was also included in the study.

Training intervention

A comprehensive face-to-face training intervention was delivered to family health workers on cervical cancer, HPV infection and HPV vaccination. The training intervention consisted of a two-hour training session delivered by family medicine specialists, public health specialists and cancer screening and infectious disease experts from the provincial health directorate. The training sessions were scheduled for a total of 8 hours in one day. Those who agreed to participate in the study were divided into three separate days, and one-day training was given to three separate groups by the same trainers to ensure that primary health care services were not disrupted and to ensure standardization of the training intervention.

The content of the training session included

- Epidemiology of cervical cancer, including global and local burden,
- Symptoms and early diagnosis of cervical cancer
- HPV types and the role of HPV in cervical cancer
- Prevention strategies, including HPV vaccination and cervical cancer screening,
- Misconceptions about HPV vaccines are explained.

Statistical analysis

IBM SPSS version 26.0 was used for data analysis. Data on demographic characteristics, knowledge and attitudes about cervical cancer, HPV and HPV vaccine were presented using descriptive statistics with numbers, percentages and arithmetic means. To assess the effectiveness of the educational intervention, differences between the pre-test and post-test were evaluated using a dependent

groups t-test. In statistical analyses, values below p<0.05 were considered significant.

Results

The study was carried out with 393 family health workers. Of the participants, 348 (95.9%) were female and 314 (86.5%) were married. The mean age of the participants was 39.93±6.95 years. The average professional experience was 18.34±7.36 years and the average experience as a family health worker was 10.24±4.83 years. The number of those with a daughter was 233 (64.2%) and the number of those with a daughter was who were considering HPV vaccination is 159 (68.2%). The number of those with a son was is 241 (66.4%) and the number of those with a son was who are considering HPV vaccination is 116 (48.1%). The number of those who feel they have sufficient knowledge about HPV and HPV vaccines is 210 (57.9%). The number of family health workers who had received HPV vaccination was only 11 (3.0%). Data on demographic characteristics are shown in Table 1.

When the level of knowledge about HPV infection and HPV vaccines was analysed, 210 participants reported that they had sufficient knowledge. Only 11 of the family health workers had received the HPV vaccine. Of those with girls, 68.2% would consider HPV vaccination for their daughters and 48.1% of those with boys would consider HPV vaccination for their sons. After the training, there was a statistically significant increase in the assessment of knowledge about HPV, attitudes towards vaccination, and attitudes towards HPV vaccination for children of both sexes. Data on levels of knowledge and attitudes about HPV infection and vaccines and the effect of the training on these levels of knowledge and attitudes are shown in Table 2.

When analyzing the responses to the information questions about cervical cancer, HPV infection and HPV vaccines, the propositions *'HPV vaccine is recommended 3 doses between the ages of 9-14 years and 2 doses after the age of 15'* with 26 (7.2%), *'All existing HPV vaccines protect against both warts and cancer'* with 68 (18.7%) and *'HPV*

Table 1. Demographic characteristics and HPV knowledge and attitudes

	n	%
Gender		
Female	348	95.9
Male	15	4.1
Marital status		
Married	314	86.5
Single	29	8.0
Widowed / Divorced	20	5.5
Knowledge of HPV infection and vaccines		
I have enough information	210	57.9
I don't have enough information	153	42.1
HPV vaccination status		
Yes	11	3.0
No	352	97.0
Thinking about getting vaccinated against HPV		
I'm thinking of getting vaccinated.	207	57.0
I don't plan on getting vaccinated.	145	39.9
I am vaccinated	11	3.0
Having a daughter		
I have	233	64.2
I don't have	130	35.8
Having a son		
I have	241	66.4
I don't have	122	33.6
Would you consider HPV vaccination for your daughter?		
I'll get my daughter vaccinated against HPV	159	68.2
I won't give my daughter the HPV vaccine	17	7.3
Undecided	57	24.5
Would you consider HPV vaccination for your son?		
I'll get my son vaccinated against HPV	116	48.1
I won't give my son the HPV vaccine	37	15.4
Undecided	88	36.5

Table 2. Effect of educational intervention on HPV knowledge and attitudes

	Before training		After training		t	*p*
	n	%	n	%		
Level of knowledge about HPV						
I have enough information	210	57.9	314	86.5	10.078	<**0.001**
I don't have enough information	153	42.1	49	13.5		
Thinking about getting vaccinated against HPV						
I'm thinking of getting vaccinated.	207	57.0	283	78.0	9.066	<**0.001**
I don't plan on getting vaccinated.	145	39.9	69	19.0		
I am vaccinated	11	3.0	11	3.0		
Would you consider HPV vaccination for your daughter?						
I'll get my daughter vaccinated against HPV	159	68.2	195	83.7	5.941	<**0.001**
I won't give my daughter the HPV vaccine	17	7.3	8	3.4		
Undecided	57	24.5	30	12.9		
Would you consider HPV vaccination for your son?						
I'll get my son vaccinated against HPV	116	48.1	174	72.2	7.246	<**0.001**
I won't give my son the HPV vaccine	37	15.4	19	7.9		
Undecided	88	36.5	48	19.9		

vaccine should be repeated every 5 years' with 71 (19.6%) are the propositions with the lowest percentage of correct responses by family health workers. When the propositions with the highest percentage of correct answers before the training were examined, the propositions *'HPV DNA and smear test is carried out as part of the cervical cancer screening program in our country'* with 350 (96.4%), *'Polygamy is a risk factor for HPV infection'* with 334 (92.0%) and *'HPV DNA/smear test should only be carried out in women with complaints'* with 332 (91.5%) were the propositions with the highest percentage of correct answers by family health workers. The responses given by the family health workers and the effect of the educational intervention on the responses given are shown in Table 3.

Discussion

Healthcare workers play a key role in the prevention of cervical cancer and HPV infection. This study assessed the knowledge and attitudes of family health workers towards cervical cancer, HPV infection and HPV vaccines, and examined the effect of training on these knowledge and attitudes. The results show that the training intervention significantly improved the knowledge and attitudes of family health workers towards HPV infection and HPV vaccines.

Although the fact that the majority of family health workers participating in the study were women (95.9%) led to the expectation of a high level of awareness about cervical cancer and HPV vaccination, only 57.9% of family health workers felt that they had sufficient knowledge about HPV as a result of the pre-test. The introduction of new vaccines that are not included in the national immunization program faces various barriers, both for the provider and the recipient.[10] This obstacle can be overcome, in particular, by the trust that individuals place in primary health care workers. The level of knowledge of health professionals has a direct impact on the level of trust given to patients. Healthcare professionals need to feel prepared and supported in their role of disclosing perceptions about HPV, addressing concerns, offering vaccination, and making a

Table 3. Effect of educational intervention on level of knowledge about cervical cancer, HPV and HPV vaccines

About cervical cancer, HPV infection and HPV vaccines	Before training		After training		*p**
	Correct (%)	Incorrect (%)	Correct (%)	Incorrect (%)	
Cervical cancer is the most common cancer among women		88 (24.2)		151 (41.6)	**<0.001**
The most characteristic sign of cervical cancer is malodorous vaginal discharge		147 (40.5)		148 (40.8)	0.929
HPV types 16, 18 are the most common types of virus that cause cervical cancer	290 (79.9)		361 (99.4)		**<0.001**
HPV infection is very rare		268 (73.8)		343 (94.5)	**<0.001**
HPV causes infection/disease only in women		234 (64.5)		307 (84.6)	**<0.001**
HPV infection is most commonly sexually transmitted	312 (86.0)		353 (97.2)		**<0.001**
Polygamy is a risk factor for HPV infection	334 (92.0)		358 (98.6)		**<0.001**
HPV infection is not seen in condom users		150 (41.3)		342 (94.2)	**<0.001**
HPV can cause oral and anal cancer	220 (60.6)		350 (96.4)		**<0.001**
Everyone infected with HPV will get cancer		293 (80.7)		349 (96.1)	**<0.001**
HPV-DNA and Smear tests are performed as part of the cervical cancer screening program in our country	350 (96.4)		358 (98.6)		0.059
HPV-DNA / Smear testing should only be performed in women with symptoms		332 (91.5)		356 (98.1)	**<0.001**
There are 3 types of HPV vaccine in our country	160 (44.1)		342 (94.2)		**<0.001**
HPV vaccine is reimbursed in Turkey		193 (53.2)		318 (87.6)	**<0.001**
HPV vaccine is administered intramuscularly	229 (63.1)		349 (96.1)		**<0.001**
HPV vaccine is given to females only		177 (48.8)		354 (97.5)	**<0.001**
HPV vaccine given only to sexually active women		284 (78.2)		355 (97.8)	**<0.001**
HPV vaccine should be given after first sexual contact		272 (74.9)		337 (92.8)	**<0.001**
The earlier the HPV vaccine is given, the greater the benefit	292 (80.4)		356 (98.1)		**<0.001**
HPV vaccine is more effective in people who have not been exposed to HPV	209 (57.6)		320 (88.2)		**<0.001**
HPV vaccine is recommended 3 doses between 9 and 14 years of age and 2 doses after 15 years of age		26 (7.2)		292 (80.4)	**<0.001**
HPV vaccination should be repeated every 5 years		71 (19.6)		315 (86.8)	**<0.001**
HPV vaccine is almost 100% protective against cervical cancer caused by HPV subtypes 16-18	192 (52.9)		349 (96.1)		**<0.001**
The quadrivalent vaccine aims to prevent disease caused by HPV subtypes 6, 11, 16 and 18	189 (52.1)		334 (96.1)		**<0.001**
A person infected with one of the HPV types does not need to be vaccinated		134 (36.9)		301 (82.9)	**<0.001**
All available HPV vaccines protect against both warts and cancer		68 (18.7)		121 (33.3)	**<0.001**

Table 3. Continued

About cervical cancer, HPV infection and HPV vaccines	Before training		After training		*p**
	Correct (%)	Incorrect (%)	Correct (%)	Incorrect (%)	
HPV vaccine also protects against other sexually transmitted diseases		191 (52.6)		207 (57.0)	0.198
HPV-DNA / Smear test not required before HPV vaccination	125 (34.4)		293 (80.7)		**<0.001**
Continue cervical cancer screening after HPV vaccination	319 (87.9)		355 (97.8)		**<0.001**

shared decision with their patients.[11] However, both in this study and in the literature, healthcare professionals were found to have insufficient knowledge about HPV.[12-15] Although the study is consistent with the literature in this regard, it was felt that more training should be organized for healthcare professionals on this topic.

Participants had a relatively high level of knowledge about HPV screening and risk factors. The correct response rate to the statement *"HPV-DNA and Smear tests are performed as part of the cervical cancer screening program in our country"* was 96.4%, while the correct response rate to the statement *"Polygamy is a risk factor for HPV infection"* was 92.0%. This shows that there is greater awareness of screening programs and risk factors. The interpretation is that this awareness is due to the fact that HPV screening is a secondary prevention method that has been used in the daily practice of family health centers for a longer time, but HPV vaccination, which is primary prevention, has gained importance especially in the recent period and has not yet reached a sufficient level of awareness.

In the pre-test, it was observed that family health workers lacked knowledge about HPV vaccines in many sub-dimensions, especially the number of vaccine doses. After the training intervention, a statistically significant increase in participants' knowledge of HPV infection and vaccines was observed. This suggests that the educational intervention was effective. In the literature, there are results showing that educational interventions for healthcare professionals increase the level of knowledge about HPV and HPV vaccines and the tendency to recommend vaccination.[10,11,16,17] Although many studies have shown that educational interventions are significantly effective in changing people's knowledge and attitudes, it is noteworthy that the level of knowledge about vaccination was found to be insufficient in the pre-test phase in this study. It was assessed that there is still no effective educational planning and implementation on this issue at the national level.

Another important finding of the study is that after the educational intervention, participants reported that it would positively change their tendency to vaccinate both themselves and their children. The fact that increases in knowledge and awareness lead to changes in attitudes and behavior is also supported by the literature.[16-18] It has been suggested that people who change their behavior towards vaccination for both themselves and their children will be more effective in terms of removing hesitancy, providing information and reassurance, recommending and persuading vaccination.

As the research data was collected using a data tool with selective response options such as true

/ false / undecided, the high probability of success of the responses given is a limitation. Although the research covered the whole province, the fact that it was conducted in a single province limits its generalizability to the whole country. Another limitation is that the long-term effects of the training intervention cannot be evaluated.

In conclusion, the educational intervention was found to be effective in increasing primary health care workers' knowledge about HPV and vaccines. Future research should focus on examining the long-term effects of these trainings and how they are reflected in HPV vaccination rates. It is recommended that regular training programs be implemented to keep family health workers' knowledge and attitudes about HPV up to date.

Ethical approval

This study has been approved by the Ethics Committee for Clinical Research of Samsun University (approval date 15.02.2023, number SÜKAEK-2023 3/5). Written informed consent was obtained from the participants.

Author contribution

The authors declare contribution to the paper as follows: Study conception and design: BY, İMY, EÖ; data collection: BY, EÖ; analysis and interpretation of results: BY, İMY; draft manuscript preparation: BY, İMY, EÖ, MAO. All authors reviewed the results and approved the final version of the article.

Source of funding

The authors declare the study received no funding.

Conflict of interest

The authors declare that there is no conflict of interest.

References

1. Daponte N, Valasoulis G, Michail G, et al. HPV-Based Self-Sampling in Cervical Cancer Screening: An Updated Review of the Current Evidence in the Literature. Cancers (Basel). 2023;15(6):1669. **[Crossref]**
2. Republic of Türkiye Ministry of Health. Sağlık İstatistikleri Yıllığı 2022. Available at: https://dosyasb.saglik.gov.tr/Eklenti/48054/0/siy202205042024pdf.pdf (Accessed on July 5, 2024).
3. Turki YM, Alqurashi J. Knowledge, Attitudes, and Perceptions Towards Human Papillomavirus (HPV) Vaccination Among Adult Women in Primary Health Care Centers in Makkah, Saudi Arabia. Cureus. 2023;15(8):e44157. **[Crossref]**
4. Choi S, Ismail A, Pappas-Gogos G, Boussios S. HPV and Cervical Cancer: A Review of Epidemiology and Screening Uptake in the UK. Pathogens. 2023;12(2):298. **[Crossref]**
5. Yakşi N, Topaktaş B. Knowledge Beliefs and Barriers of Healthcare Workers about Human Papilloma Virus (HPV) and HPV Vaccination. Acıbadem University Health Sciences Journal. 2023;14(2):183-189. **[Crossref]**
6. Sharma R, Parashar H, Paul S. Awareness of HPV and Acceptability of HPV Vaccine Among Students & Employee Working in a Tertiary Care Centre: A Cross - Sectional Survey. International Journal of Life Sciences Biotechnology and Pharma Research. 2023;12(2):1262-1269.
7. Khamisy-Farah R, Endrawis M, Odeh M, et al. Knowledge of Human Papillomavirus (HPV), Attitudes, and Practices Towards Anti-HPV Vaccination Among Israeli Nurses. J Cancer Educ. 2023;38(4):1391-1396. **[Crossref]**
8. Kassymbekova F, Zhetpisbayeva I, Tcoy E, et al. Exploring HPV vaccine knowledge, attitudes, barriers and information sources among parents, health professionals and teachers in Kazakhstan: a mixed-methods study protocol. BMJ Open. 2023;13(9):e074097. **[Crossref]**

9. Waller J, Waite F, Marlow L. Awareness and knowledge about HPV and primary HPV screening among women in Great Britain: An online population-based survey. J Med Screen. 2024;31(2):91-98. **[Crossref]**

10. Garbutt JM, Dodd S, Walling E, Lee AA, Kulka K, Lobb R. Theory-based development of an implementation intervention to increase HPV vaccination in pediatric primary care practices. Implement Sci. 2018;13(1):45. **[Crossref]**

11. Trucchi C, Restivo V, Amicizia D, et al. Italian Health Care Workers' Knowledge, Attitudes, and Practices Regarding Human Papillomavirus Infection and Prevention. Int J Environ Res Public Health. 2020;17(15):5278. **[Crossref]**

12. Akova İ, Ekici Koşaroğlu N, Kılıç E. Knowledge, attitudes, and Behaviours of Primary Health Care Workers Regarding HPV Infection and Prevention: an Example from Türkiye. Turkish Journal of Family Medicine and Primary Care. 2023;17(3):407-415. **[Crossref]**

13. Thanasa E, Thanasa A, Kamaretsos E, et al. Awareness Regarding Human Papilloma Virus Among Health Professionals and Will to Accept Vaccination: A Systematic Review. Cureus. 2022;14(10):e30855. **[Crossref]**

14. Xu X, Wang Y, Liu Y, et al. A nationwide post-marketing survey of knowledge, attitudes and recommendations towards human papillomavirus vaccines among healthcare providers in China. Prev Med. 2021;146:106484. **[Crossref]**

15. Sherman SM, Cohen CR, Denison HJ, Bromhead C, Patel H. A survey of knowledge, attitudes and awareness of the human papillomavirus among healthcare professionals across the UK. Eur J Public Health. 2020;30(1):10-16. **[Crossref]**

16. Chen H, Zhang X, Wang W, et al. Effect of an educational intervention on human papillomavirus (HPV) knowledge and attitudes towards HPV vaccines among healthcare workers (HCWs) in Western China. Hum Vaccin Immunother. 2021;17(2):443-450. **[Crossref]**

17. Leung SOA, Akinwunmi B, Elias KM, Feldman S. Educating healthcare providers to increase Human Papillomavirus (HPV) vaccination rates: A Qualitative Systematic Review. Vaccine X. 2019;3:100037. **[Crossref]**

18. Torabizadeh C, Nick N, Vizeshfar F, Jamalimoghadam N, Bagheri S. Effectiveness of an Educational Intervention to Increase Human Papillomavirus Knowledge and Attitude in Staff and Nursing Students. J Community Health Nurs. 2020;37(4):214-221. **[Crossref]**

Turk J Fam Pract 2025;29(1):10-19
DOI: 10.54308/TJFP.2025.812

Research Article

Determining the learning styles of family medicine residents and investigating their relationship with personality traits

Rabia Alas[1], Merthan Tunay[1]

[1]Department of Family Medicine, Adana City Training and Research Hospital, Adana, Türkiye

ABSTRACT

Objective: This study aims to define the learning styles and personality traits of family medicine residents and to explore their interrelationships, contributing to a better understanding of how these factors can enhance the effectiveness of residency training. Unlike previous research, this study specifically examines the alignment between learning styles and personality traits within the context of family medicine training, providing new insights into personalized educational strategies.

Methods: This cross-sectional descriptive study was conducted with 97 family medicine residents in Adana City Training and Research Hospital between 15 February 2023 and 15 April 2023. Sociodemographic data questions, Kolb Learning Styles Inventory-3 and Big Five-50 Personality Test (BFPI-50-Tr) were collected through face-to-face interviews with the participants and the data were analyzed with IBM SPSS 24.0 software.

Results: The majority of the participants exhibited a diverging learning style (48.5%), followed by accommodating (29.9%) and assimilating (19.6%) styles. The highest mean score in personality traits was observed in agreeableness (40.11±4.32), while the lowest mean score was found in extraversion (30.23±6.70). There was no statistically significant relationship between personality test results and learning styles ($p > 0.05$).

Conclusion: The findings suggest that the majority of family medicine residents prefer diverging and accommodating learning styles, which emphasize learning through experience, discussion, and practical application. To optimize residency education, training programs should incorporate group discussions, brainstorming activities, and experiential learning methods tailored to these styles. Additionally, considering the high agreeableness scores among residents, fostering collaborative and interactive learning environments may further enhance their professional development.

Keywords: learning, personality, residency

Introduction

Learning, which is an active process, is defined as a means of acquiring knowledge, skills and experience that creates continuous and permanent behavioral change.[1] This behavior change can occur through learning, repetition and experience. In order for this action, which can occur consciously or unconsciously, to be called learning, this change in behavior must not

✉ Merthan Tunay ▪ merthan.tunay@saglik.gov.tr
Received: 13.11.2024 **Accepted:** 10.03.2025 **Published:** 26.03.2025

be present in the person's memory beforehand.[2] Although there are many theories to understand how learning occurs, behavioral, cognitive and experiential learning theories are widely discussed until now.[3] According to Kolb, experiential learning is a process in which knowledge is created through the transformation of experience; knowledge arises from the combination of comprehension and transformation of experience.[4,5] In the experiential learning model, the two parts associated with experiential comprehension consist of concrete experience and abstract conceptualization. Similarly, the two parts associated with transforming experience are reflective observation and active practice. The relationship between these four learning expressions reveals learning. This process is described as a learning cycle.[4] Concrete experience refers to learning by feeling. It can be said that people who prefer to learn in this way are open-minded learners who act by relying on their intuition while learning.[6] Individuals who use the learning path on the axis of reflective observation preference learn by watching and want to examine and understand the deep thought of situations with why-why questions, they are learners who can look at events from different perspectives. Individuals who prefer the learning path on the axis of abstract conceptualization learn by reasoning. Individuals who prefer active experience-based learning learn actively by performing. They are learners who like to apply and enjoy achieving their goals.[7]

Personality is a concept that distinguishes the individual who interacts in communities from others and characterizes his/her unique uniqueness. It describes the self-conscious individual's ability to realize himself/herself uniquely and permanently.[8] Researchers have obtained results on the five basic dimensions of personality with different data sets, and although there are still debates on the five basic constructs, these factors can be listed as openness, conscientiousness, extraversion, agreeableness, neuroticism / emotional balance according to the majority.[9] Individuals with high extraversion scores are energetic, positive, warm, sociable and prefer to spend time in social environments. It can be said that the neuroticism dimension score is low in individuals whose emotional balance changes frequently and who show reactions that are not compatible with the effect of the situation experienced.[5,10] Individuals with high scores in the openness dimension have developed imagination, are open to new ideas and experiences, and are curious. The basic dimension of conscientiousness is high in individuals who are in control, planned, stable and organized, while it is low in individuals who are easily distracted and have low reliability.[10] Individuals with high agreeableness score prioritize doing business together over competing.[10] An important factor for success in a professional career is the compatibility of personality traits with the characteristics of the chosen profession.[11]

Family medicine residency aims to equip physicians with a broad range of competencies, including problem-solving skills, adaptability, and effective communication, to provide holistic and continuous patient care. Understanding the learning styles and personality traits of family medicine residents is crucial for optimizing medical education. By identifying individual learning preferences, educators can tailor teaching methods to enhance knowledge retention and clinical decision-making skills. In a field where physicians must balance medical expertise with interpersonal skills, a personalized and structured educational approach can significantly enhance the effectiveness of family medicine training. For these reasons, this study was designed to determine learning styles and their relationship with personality traits.

Materials and Methods

Study type

This cross-sectional study was conducted between 15 February 2023 and 15 April 2023 with 97 family medicine residents working in Adana City Training and Research (ACTR) Hospital.

Study group

The population of the research consisted of 130 family medicine residents working in ACTR hospital. In the calculation made with the Epi-Info statistical program, the sample size was found to be 97 people with 80% power, 95% confidence interval and 5% margin of error. Residents who agreed to participate and completed the consent form were included in the study, while participants who did not agree to participate or who later withdrew consent were excluded from the study.

Procedures

Sociodemographic data (age, gender, marital status, mother and father's education level, family type, number of siblings, type of high school graduated from, duration of professional experience, time spent in residency, 5-point Likert questionnaire, branch satisfaction and dream branch, first learning habits, sites where most time is spent on the internet), Kolb Learning Styles Inventory-3 (KLSI-3) and Big Five-50 Personality Test Turkish Form (BFPI-50-Tr) were administered with a structured questionnaire form. The data were completed by face-to-face interviews with the participants. The 3rd version of the KLSI-3 published by Kolb in 1999 was adapted into Turkish by Gencel and consists of 12 questions.[12,13] BFPI-50-Tr test published by Goldberg in 1992 was translated into Turkish and published by Arkun Tatar in 2017. It consists of 50 questions.[14,15]

Statistical analysis

IBM SPSS version 24.0 statistical package program was used to analyze the data obtained. Descriptive statistics related to the socio-demographic characteristics of the participants were performed. Student's t-test was used for two-group comparisons of normally distributed parameters and Mann-Whitney U test was used for two-group comparisons of non-normally distributed parameters. For comparisons of numerical data between more than two groups, Kruskal Wallis test was used for those not showing normal distribution. Categorical data were compared by Chi-square test. Spearman's correlation analysis was used to evaluate the relationships between numerical data. p value <0.05 was considered statistically significant.

Ethical considerations

Before the study was started, written permissions were obtained from the administrations of the universities whose students were to be included in the study's sample. The approval of the Health Sciences University ACTR Hospital Clinical Research Ethics Committee dated 02/02/2023 and numbered 121-2393 was obtained.

Results

Sixty-five percent (n:65) of the participants were female. The mean age of the participants was 31.41 years (standard deviation 6.59). The minimum age was 25 years and the maximum age was 64 years. The mean duration of professional experience of the participants was 6.6 years (standard deviation; 6.14). The minimum duration of professional experience was 1 year, the maximum was 35 years. The mean duration of residency was 2.8 years, with a minimum of 1 and a maximum of 6 years.

When the learning styles of the participants in this study were examined, 48.5 percent were diverging, 29.9 percent were accommodating, 19.6 percent were assimilating, and 2.1 percent were converging.

When the participants were grouped according to sociodemographic data such as gender, type of specialization, father and mother education level, and the answer to the question "Which medical specialization is your priority?", no difference was found between the groups in terms of learning styles (p>0.05) (Table 1).

In the answers to the mobile applications that the participants spent the most time on the internet, it was seen that 40.2% of them used Instagram®, 25.8% used YouTube®, 7.2% used Twitter®, and no statistical significance was found between application usage preference and learning styles and BFPI-50-Tr data (p>0.05).

When asked what would be the first method they would use to learn about a subject they had no prior knowledge of, 84.5% said they would use the Internet, 10.3% would ask a friend who they thought knew the subject, 3.1% would watch a video and 2.1% would read a book.

When the participants were grouped according to gender, specialty type and the answer to the question "Which medical specialty is your priority?", no difference was found between the groups in terms of mean BFPI-50 scores (p>0.05) (Table 2).

BFPI-50-Tr results, extraversion was the most common factor with an average score of 40.11±4.32, while conscientiousness was found to be 38.56±6.65 and openness was found to be 37.41±4.59. The lowest mean scores were found as neuroticism (31.32±7.66) and extraversion (30.23±6.70). When the participants' high school graduation, parental education level, and the mobile applications they spend the most time on the Internet were compared with the BFPI-50-Tr, no statistical difference was found (p>0.05).

In addition, Table 3 summarizes the learning styles that can be associated with personality traits and summarizes the data obtained in the study.

Discussion

Family medicine residency aims to equip physicians with a broad range of competencies, including problem-solving skills, adaptability, and effective communication, to provide holistic and continuous patient care. Understanding the learning styles and personality traits of family medicine residents is crucial for optimizing medical education. In our country, the importance of family medicine residency in the provision of primary health care services and the process of specialization of general practitioners working

Table 1. Distribution of family medicine residents according to learning style (n=97)

Learning Styles	Gender		Types of residencies		Father's education level			Mother's education level			Which medical residency is your priority?			
	F	M	FT	PT	ES	MS	UN	ES	MS	UN	D	P	F	P
Diverging	29	18	35	12	14	17	16	24	9	14	5	4	8	10
Accommodating	24	5	26	3	7	8	14	14	9	6	8	3	0	2
Assimilating	11	8	18	1	3	10	6	8	10	1	1	1	4	1
Converging	1	1	1	1	0	2	0	0	2	0	1	1	0	0
p	.185+		.086*		.357*			.036*			.017*			

F: Female, M: Male, +: χ^2 test, *: Fisher's Exact Test, FT: Full-time residents, PT: Part-time residents, ES: Primary school and below, MS: Middle - high school, UN: University and above, D: Dermatology, P: Psychiatry, F: Physical Medicine and Rehabilitation, PS: Plastic Surgery

Table 2. BFPI-50-Tr assessment of family medicine residents(n=97)

BFPI-50-Tr assessment	Gender				Types of residencies				Which medical residency is your priority?				
	F	M	P+	d'	FT	PT	P^	d'	D	P	F	PS	P*
Extraversion	30.14 ± 6.99	30.44 ± 6.17	.838	.04	30.16 ± 6.94	30.77 ± 5.60	.723	.10	28.60 ± 3.56	32.44 ± 9.33	28.76 ± 8.99	30.54 ± 5.59	.539
Agreeableness	40.61 ± 4.15	39.09 ± 4.55	.104	.35	39.85 ± 4.47	41.35 ± 3.43	.195	.37	39.54 ± 3.42	39.89 ± 4.76	40.75 ± 5.64	40.54 ± 4.20	.890
Conscientiousness	38.87 ± 6.34	37.93 ± 7.33	.516	.13	38.81 ± 6.89	37.41 ± 5.44	.434	.22	36.07 ± 8.77	37.44 ± 8.20	38.42 ± 6.76	38.39 ± 6.10	.826
Neuroticism	30.13 ± 7.10	33.72 ± 8.31	.030	.46	30.18 ± 7.20	36.70 ± 7.69	.001	.87	28.80 ± 5.77	33.00 ± 7.37	28.25 ± 8.57	35.00 ± 5.20	.040
Openness	36.83 ± 4.59	38.59 ± 4.44	.076	.38	37.16 ± 4.43	38.59 ± 5.32	.248	.29	38.08 ± 4.74	36.66 ± 4.61	37.33 ± 4.65	39.15 ± 4.26	.611

+: Anova, *: Kruskal Wallis, ^: İndependent Sample T Test, ': Cohen's d, F: Female, M: Male, FT: Full-time residents, PT: Part-time residents, D: Dermatology, P: Psychiatry, F: Physical Medicine and Rehabilitation, PS: Plastic Surgery

in the field continues rapidly. In 2024, there are 2720 family medicine residency positions in the medical specialization exam. Current family medicine fellows work by optimizing educational opportunities for the increasing number of medical residencies. Determining the learning styles and personality traits of physicians can be considered as a suggestion to relieve the optimization effort. In this study, 48.5% of family medicine residents had a diverging learning style. Individuals with diverging learning styles learn by feeling and watching. This feature is more related to creativity. According to Kolb, those who prefer a diverging learning style have a strong imagination ability. These people are sensitive to meaning and values and perform best in situations that require the generation of alternative ideas and results, such as brainstorming.[4] They can see concrete situations from many perspectives and are multidimensional thinkers.[5] They are open-minded, like to work with others, and have broad cultural interests. They have a high holistic perception and can integrate many relationships into a meaningful whole. The accommodating learning style overlaps with family physicians' style that such as to listen to people, cares about values, can associate symptoms and diseases and evaluate the patient from a holistic perspective, prefers to exchange information and co-operate with colleagues, and can produce alternative ideas in the treatment of patients. Since each physician has a unique way of learning, understanding their strengths and weaknesses in this respect will help educators to develop appropriate learning techniques. For family medicine residents with a diverging learning style, the use of multiple perspectives in education and the diversity of educational materials and activities may be beneficial. Inclusion of creative activities in education, group work in a way that they can discuss, and share can make education more enjoyable for these individuals. Providing feedback to residents during the education process may improve the education of individuals who learn in this style.[2-5]

Table 3. The relationship between BFPI-50-Tr mean scores and the learning styles

BFPI-50 Personality Trait	Related learning style	Explanation		Diverging	Accommodating	Assimilating	Converging
Extraversion	Accommodating or diverging	Extraverted individuals tend to prefer social interactions and active experiences. They are drawn to group work, discussions, and hands-on activities.	r	.060	-.039	-.132	.086
			p	.557	.703	.197	.404
Agreeableness	Diverging	Agreeable individuals are cooperative and empathetic, making them more comfortable with collaborative learning, group discussions, and exploring others' perspectives.	r	-.012	-.084	.000	.071
			p	.911	.412	.997	.491
Conscientiousness	Assimilating or Converging	Highly conscientious individuals prefer structured learning environments with clear goals. They are often inclined toward understanding theoretical models and working systematically.	r	-.063	-.058	-.020	.147
			p	.542	.571	.846	.151
Neuroticism	Diverging or accommodating	Individuals with high neuroticism may prefer supportive and low-pressure learning environments. They tend to feel more comfortable with experiential and flexible learning rather than abstract conceptualization under stress.	r	-.070	.090	.049	-.017
			p	.493	.380	.630	.868
Openness	Diverging or assimilating	Open individuals are curious and creative, often drawn to innovative ideas and novel experiences. They are likely to embrace both abstract thinking and hands-on exploration.	r	-.056	.000	-.067	.095
			p	.588	1.000	.516	.356

29.9% of family medicine residents learn with the accommodating learning style. Accommodating learning style is a style that comes to the forefront in the plan-program making, decision-making and implementation phase. They seek opportunities to lead a community and assume a leadership role. They tend to integrate with society personally. They act on emotional data rather than logical explanations. It coincides with the fact that family physicians are individuals who give importance to the opinions of other colleagues in the multidimensional treatment of patients, who need to lead because they manage a patient in every aspect, who have a high ability to lead other health personnel in their own workplaces, and who require community involvement and integration.[2,4,5]

In this study, in the evaluation of family medicine residents according to the B5PI-50-Tr, it was determined that the highest mean score was in the field of agreeableness factor, followed by the conscientiousness factor, and the lowest means were in the extraversion and neuroticism. Openness factor ranked third in the mean score. In a study conducted by Maron et al. evaluating the specialty choices and personality traits of medical students, students who chose family medicine residents had low scores in neuroticism compared to others.[16] Students who chose family

medicine had higher scores in agreeableness and conscientiousness than those who chose other specialties, but these differences did not reach statistical significance. The personality traits of the researchers in surgical residents were not found to be different from those of the students who chose non-surgical specialties. According to the results of this study, it can be said that personality profiles existing before medical school predict orientation towards some specialties.[16]

In a cross-sectional study conducted in Sweden with physicians who have completed or are about to complete their specialization in various branches on the effect of personality traits on their choice of specialization, it was found that agreeableness trait was dominant among primary care physicians and internists, surgeons scored higher in the conscientiousness factor than psychiatrists and hospital service specialists (forensic medicine, medical genetics, biochemistry, radiology, etc.), but exhibited low scores in agreeableness trait, while psychiatrists were found to be prominent in openness to experience score.[17]

In a study on personality traits and career choices conducted by Mullola et al. in Finland, occupational health clinicians and general practitioners showed higher compatibility compared to other specialists.[18] Openness trait is associated with being more willing to experience, to new ideas, and to accept the unconventional. In addition, a better understanding of dominant personality traits in different disciplines in medical doctors may help interdisciplinary teamwork and patient care by promoting self-reflection and professional development. Personality trait studies to be conducted in different specialties in our country may be useful to see personality differentiation in different specialties.[18]

In a study conducted to examine personality differences between residents in surgical and internal departments in an Asian population, internal medicine residents scored higher on agreeableness.[19] It is known that more agreeable people tend to be more cooperative, polite, sympathetic, as opposed to harsh or rude. In contrast to internal medicine, where open discussion and sharing of ideas are integral to the success of a healthcare team, surgical residents scored higher on the ''extraversion'' factor, which indicates someone who is more enthusiastic, active and assertive rather than timid or shy.[19]

In the review by Borges and Savickas, family physicians were characterized by being agreeable and conscientious, but they differed in terms of openness to experience. For instance, family medicine residents have been shown to be less open to experience than primary care physicians who have completed their residency training. It was concluded that family physicians may show more conscientiousness than physicians in other specialties and that family physicians can be characterized as sympathetic, reassuring, cooperative and altruistic in relation to agreeableness.[20]

In this study, the highest mean score of family medicine residents was found to be agreeableness. The “agreeableness” trait in the BFPI-50-Tr refers to a person’s general tendency to adapt, cooperate and establish harmonious relationships. The ability to adapt quickly to new situations, to show flexibility and adapt to changing conditions, and to have a positive attitude in social relationships are more common in adaptive people. Thanks to these characteristics, well-adjusted individuals are better able to cope with stressful or uncertain situations.[21]

In family medicine practice, agreeableness can support closer and better communication with patients and improve communication skills, collaboration between patient-physician or physician-physician, coping with stress, and increasing patient satisfaction and compliance with treatment. This may result in effective health care delivery and better treatment outcomes.

Higher agreeableness scores were associated with working in the private sector and specializing in occupational health as well as general practice, while lower agreeableness scores were associated with specializing in surgery.[20] Agreeableness was also found to predict clinical competence in medical students. This may facilitate doctor-patient relationships.[18,22]

In this study, the mean conscientiousness scores were high. Conscientiousness score may help family physicians to act within the framework of professional duties and ethical values, adherence to patient care standards and fulfillment of professional responsibilities may help physicians to exhibit strong professional behavior. Like the agreeableness trait, the conscientiousness trait also predicts the ease of working together and establishing cooperation. Conscientiousness has been found to be an important predictor of success in different professional and academic settings, including medical education.[23,24] The qualities associated with conscientiousness, such as efficiency, reliability, and thoroughness, overlap with the requirements of medical practice. Low levels of conscientiousness, which can lead to poor outcomes in some fields, have even been suggested as an exclusion criterion in the evaluation process of medical school applicants.[22] Many studies have shown that personality traits influence the choice of specialty. Therefore, different specialty preferences may be related to different personality traits. For example, in a study conducted by Stilwell et al. it was observed that the choice of surgical specialty in the direction of professional development was strongly positively correlated with the trait of conscientiousness and negatively correlated with the trait of agreeableness.[25] It is assumed that individuals' personality traits being suitable for the criteria of a job is a key point in professional career.[11]

In our study, no relationship was found between learning styles and personality traits. This may be due to the small sample size. Furnham reported in his article that personality metrics, especially extraversion and neuroticism, are strongly associated with learning styles.[26] Ibrahimoglu et al. similarly reported a relationship between learning styles and personality traits.[27]

Lee and Wu reported that personality traits can be used to develop adaptive learning models to increase student learning effectiveness and that people with different personality traits have different problem-solving skills.[28]

Abouzeid et al. reported that the most common personality traits were agreeableness and openness and that they were related to personality traits, although no significant relationship was found between personality traits and academic achievement in a study conducted in medical faculty.[29]

Komarraju et al. reported that conscientiousness and agreeableness were positively related with all four learning styles.[30]

Jensen's research examined many studies in literature comparing personality traits and learning styles and as a result, conscientiousness in particular was found to be related to academic success.[31]

Study limitations and strengths

This study is a cross-sectional study conducted in a single hospital. Therefore, the results may not be generally applicable to all settings and at different time points in the physician's career, and further prospective studies with larger numbers are needed to confirm the associations found in this study. Longitudinal and larger sample size studies that also examine how learning styles and

personality traits change as physicians go through learning processes would greatly benefit the literature.

Conclusion

Determining the dominant learning styles and personality traits of family medicine residents can increase the quality of education, professional efficiency, and branch satisfaction by organizing the environment, educational tools and materials, and curriculum in educational programs. Especially considering that family medicine residents with diverging learning style, which constitutes the majority in this study, learn predominantly by using concrete experience and reflective observation, it may be recommended to prioritize educational activities that emphasize ideas such as group discussions and brainstorming. Curriculum designers and course implementers should create content to utilize all learning modes. Since there will be assistants of all learning styles in an educational environment, the use of all learning modes in education in accordance with the experiential learning cycle can improve the quality of education.

Being aware of the personality traits of individuals, especially before their professional career choices, and exhibiting appropriate behaviors while making their choices can be considered one of the most important points in building a happy and successful future for individuals. Providing counseling and mindfulness training to doctors in their educational lives can be an important step for career structuring.

Ethical approval

This study has been approved by the Health Sciences University ACTR Hospital Clinical Research Ethics Committee (approval date 02.02.2023, number 121-2393). Written informed consent was obtained from the participants.

Author contribution

The authors declare contribution to the paper as follows: Study conception and design: RA, MT; data collection: RA; analysis and interpretation of results: RA, MT; draft manuscript preparation: RA, MT. All authors reviewed the results and approved the final version of the article.

Source of funding

The authors declare the study received no funding.

Conflict of interest

The authors declare that there is no conflict of interest.

References

1. Yeşilyurt E. Öğrenme Stratejileri. OPUS Uluslararası Toplum Araştırmaları Dergisi. 2021;18(Özel Sayı):5116-5139. **[Crossref]**
2. Gencel İE, Erdoğan M. Kolb'un Yenilenen Öğrenme Stili Sınıflamasına İlişkin Bir İnceleme. Yaşadıkça Eğitim. 2022;36(3):813-833. **[Crossref]**
3. Keleş E, Çepni S. Beyin ve öğrenme. Journal of Turkish Science Education. 2006;3(2):66-82.
4. Kolb DA. Experiential learning: Experience as the source of learning and development. FT Press; 2014.
5. Hydrie MZI, Naqvi SMZH, Alam SN, Jafry SIA. Kolb's Learning Style Inventory 4.0 and its association with traditional and problem based learning teaching methodologies in medical students. Pak J Med Sci. 2021;37(1):146-150. **[Crossref]**
6. Gürpınar E, Batı H, Tetik C. The Determinate of Learning Styles of Medical Students. Tıp Eğitimi Dünyası. 2011;32:18-30.
7. Kolb AY, Kolb DA. Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education. Academy of Management Learning & Education. 2005;4(2):193-212. **[Crossref]**
8. Ozer DJ, Benet-Martínez V. Personality and the prediction of consequential outcomes. Annu Rev Psychol. 2006;57:401-421. **[Crossref]**
9. Burger JM. Kişilik: Psikoloji biliminin insan doğasına dair söyledikleri. İstanbul: Kaknüs Yayınları; 2006.

10. Arthur W, Graziano WG. The five-factor model, conscientiousness, and driving accident involvement. J Pers. 1996;64(3):593-618. **[Crossref]**

11. Holland JL. Making Vocational Choices: A Theory of Vocational Personalities and Work Environments. 3rd ed. Odessa: Psychological Assessment Resources; 1997.

12. Gencel İE. Kolb'un Deneyimsel Öğrenme Kuramına Dayalı Öğrenme Stilleri Envanteri-III'ü Türkçeye uyarlama çalışması. Dokuz Eylül Üniversitesi Sosyal Bilimler Enstitüsü Dergisi. 2007;9(2):120-139.

13. Kolb AY, Kolb DA. The Kolb Learning Style Inventory-Version 3.1 2005 Technical Specifications. 1st ed. Case Western Reserve University, HaYGroup; 2005: 1-72.

14. Goldberg LR. The development of markers for the Big-Five factor structure. Psychol Assess. 1992;4(1):26-42. **[Crossref]**

15. Tatar A. Translation of Big-Five Personality Questionnaire into Turkish and comparing it with Five Factor Personality Inventory Short Form. Anatolian Journal of Psychiatry. 2017;18(1):51–61. **[Crossref]**

16. Maron BA, Fein S, Maron BJ, Hillel AT, El Baghdadi MM, Rodenhauser P. Ability of prospective assessment of personality profiles to predict the practice specialty of medical students. Proc (Bayl Univ Med Cent). 2007;20(1):22-26. **[Crossref]**

17. Bexelius TS, Olsson C, Järnbert-Pettersson H, Parmskog M, Ponzer S, Dahlin M. Association between personality traits and future choice of specialisation among Swedish doctors: a cross-sectional study. Postgrad Med J. 2016;92(1090):441-446. **[Crossref]**

18. Mullola S, Hakulinen C, Presseau J, et al. Personality traits and career choices among physicians in Finland: employment sector, clinical patient contact, specialty and change of specialty. BMC Med Educ. 2018;18(1):52. **[Crossref]**

19. Kyaw L, Loh KY, Tan YQ, Wu FMW, Tiong HY, Wang Z. Personality differences between internal medicine and surgical residents in an Asian population. BMC Med Educ. 2022;22(1):650. **[Crossref]**

20. Borges NJ, Savickas ML. Personality and Medical Specialty Choice: A Literature Review and Integration. J Career Assess. 2002;10(3):362-380. **[Crossref]**

21. Costa PT, McCrae RR. Four ways five factors are basic. Pers Individ Dif. 1992;13(6):653-665. **[Crossref]**

22. Hojat M, Erdmann JB, Gonnella JS. Personality assessments and outcomes in medical education and the practice of medicine: AMEE Guide No: 79. Med Teach. 2013;35(7):e1267-e1301. **[Crossref]**

23. Hurtz GM, Donovan JJ. Personality and job performance: the Big Five revisited. J Appl Psychol. 2000;85(6):869-879. **[Crossref]**

24. Doherty EM, Nugent E. Personality factors and medical training: a review of the literature. Med Educ. 2011;45(2):132-140. **[Crossref]**

25. Stilwell NA, Wallick MM, Thal SE, Burleson JA. Myers-Briggs type and medical specialty choice: a new look at an old question. Teach Learn Med. 2000;12(1):14-20. **[Crossref]**

26. Furnham A. Personality and learning style: A study of three instruments. Pers Individ Dif. 1992;13(4):429-438. **[Crossref]**

27. Ibrahimoglu N, Unaldi I, Samancioglu M, Baglibel M. The relationship between person- ality traits and learning styles: a cluster analysis. Asian Journal of Management Sciences and Education. 2013;2(3):93-108.

28. Lee PJ, Wu TY. Mining relations between personality traits and learning styles. Inf Process Manag. 2022;59(5):103045. **[Crossref]**

29. Abouzeid E, Fouad S, Wasfy NF, Alkhadragy R, Hefny M, Kamal D. Influence of Personality Traits and Learning Styles on Undergraduate Medical Students' Academic Achievement. Adv Med Educ Pract. 2021;12:769-777. **[Crossref]**

30. Komarraju M, Karau SJ, Schmeck RR, Avdic A. The Big Five personality traits, learning styles, and academic achievement. Pers Individ Dif. 2011;51(4):472-477. **[Crossref]**

31. Jensen M. Personality Traits, Learning and Academic Achievements. Journal of Education and Learning. 2015;4(4):91-118. **[Crossref]**

Turk J Fam Pract 2025;29:20-35
DOI: 10.54308/TJFP.2025.811

Research Article

Telehealth applications in home health services: A bibliometric analysis

Özden Güdük[1]

[1]Department of Healthcare Management, Faculty of Economics, Administrative and Social Sciences, Istinye University, İstanbul, Türkiye

ABSTRACT

Background: In addition to being cost-effective, home health services are preferred for the patient. Recently, there have been developments integrating home health services with telehealth. This study aims to analyze published studies on telehealth applications in home health services using the bibliometric method.

Methods: Data were obtained from the Web of Science Core Collection database on 10.08.2024. Year restrictions were not applied, and publications in English were selected. The search used the keywords 'homecare' OR 'home healthcare' OR 'hospital in the home' AND 'telehealth' OR 'remote.' VOSviewer and SciMAT software were used for the analysis. Publications were analyzed based on author, country, number of citations, keywords, index, year of publication, and research area. The period from 1985 to 2024 was divided into four periods, and strategic diagram analyses were performed.

Results: A total of 3197 publications were identified. The top three countries with the highest number of publications are the USA, Australia, and England. The most frequently used keywords are 'telehealth', 'telemedicine', and 'remote patient monitoring'. The theme was "homecare" in the first period. "diabetes care", and "internet", "aging people" were prominent in the second period, while "telehealth", "dementia", "wearable device", and "palliative care" were significant in the third period. In the fourth period, the themes were "internet of things", "elderly care", "caregivers", and "wearable devices".

Conclusion: Telehealth has started to be more widely used in home health services due to technological advancements. The increasing interest in following and treating individuals with chronic diseases and patients in need of palliative care at home is attributed to patient-centered service provision.

Keywords: home health care, home care service, telehealth, telemedicine

Introduction

Healthcare systems across the world have traditionally focused on centralized delivery of care within hospitals. However, recent developments have shifted the focus towards providing healthcare services to individuals in their own homes.[1] With the increasing demand for healthcare services and the need to control costs, health systems need to make concerted efforts to ensure sustainability.[2] Home health services are a key component in addressing these challenges.[3]

✉ Özden Güdük ▪ ozdenguduk@gmail.com
Received: 03.11.2024 **Accepted:** 19.02.2025 **Published:** 26.03.2025

Home health services encompass a wide range of continuous and comprehensive healthcare services delivered to individuals and families in their own homes. The aim is to improve, maintain, or restore health, maximize independence, and minimize the impact of disease. These services can include promotive, preventive, curative, and rehabilitative care, or a combination of these.[4] They cover various levels of care needs and health problems experienced by individuals living at home, and are provided by health professionals from different public, private, or non-profit organizations.[5,6]

Home health services play a crucial role in preventing overcrowding and bed occupancy in hospitals, while also being a cost-effective method. Additionally, they offer psychological benefits for the patient and their family, as well as increasing satisfaction with health services. These services contribute to reducing mortality, complication rates, readmission rates, length of hospitalization, and financial pressure on health systems.[2,7] Along with being cost-effective, home health care is a preferred form of care delivery for both the patient and caregiver.[8,9] It is also an effective way to manage chronic diseases through care provided by a multidisciplinary team of skilled members.[10] Home health services can monitor and treat a variety of acute and chronic conditions, including chronic obstructive pulmonary disease (COPD), chronic kidney disease (CKD), chronic heart failure, and post-acute myocardial infarction. Furthermore, it can provide rehabilitation, home nutrition, intravenous therapy, wound care, chemotherapy, and even home clinical care for acute diseases requiring inpatient treatment.[2,7,11]

Today, home healthcare services, where the healthcare professional provides services by going to the patient's home, have blended with virtual care thanks to technological methods such as telemedicine and telemonitoring.[2,7] There are some reasons that trigger the use of telehealth technologies in home health services. The first of these is the prolongation of life expectancy worldwide, especially in developed countries, and the pressure of the increasing elderly population on health systems.[10] Elderly individuals usually have multiple chronic diseases and need healthcare services at frequent intervals. The hospitalization rate of individuals with multiple chronic diseases is over 20% within one year.[12,13] However, elderly individuals prefer to live independently in their own homes as much as possible. Integrating smart technologies into the healthcare system is important to support the elderly population with chronic diseases.[12] Not only individuals with chronic diseases but also the majority of those who need palliative care prefer home care.[14,15] There is a transition from hospital-based palliative care to community-based palliative care because it is both suitable for the patient's preferences and prevents the high cost of hospitalisation.[16] However, patients receiving palliative care services at home may have concerns such as lack of continuous communication with healthcare professionals, uncertainty about who to contact in times of need, and poor continuity of care. The use of health technologies is shown to be a good solution to address these concerns and ensure continuity of care. Home health technologies used for this purpose help the patient's symptom control and provide psychological support, effective communication with healthcare professionals and a sense of trust.[14,15] The second reason is the declining health workforce. Especially in palliative care and home care services, labour force participation is low, while turnover rates are high.[3,7,17] Telehealth can be an effective method to overcome the shortage of health personnel.[18] The third reason is the impact of the COVID-19 pandemic. In order to reduce the pressure on hospitals due to the increasing demand for healthcare services caused by the pandemic, home healthcare services have been emphasised. Non-severe COVID-19 cases and individuals with

chronic diseases requiring continuous follow-up and treatment were followed and treated at home.[11,19] During the pandemic period, the number of face-to-face visits was reduced in order to protect elderly patients with chronic diseases who benefited from home care and, moreover, the healthcare personnel providing services to them from infection, and service delivery was carried out via telephone or video-conference.[20]

Telehealth is defined as the provision of remote healthcare services through various telecommunication tools.[15] The terms telehealth or telemedicine refer to the exchange of medical information from one site to another via electronic communication to provide clinical care and improve the patient's health.[11] Telehealth allows for diagnosis, treatment, and prevention, as well as research, evaluation, and education for the patient and their relatives. It particularly benefits those in rural areas, those with young children, and those with mobility limitations by improving access to health services. Telehealth has many advantages, such as improving the patient's quality of life, reducing hospital costs, saving time, and increasing user satisfaction.[4] Telehealth applications in home health provide effective communication between health professionals, patients, and their relatives, increasing access to health professionals.[16] Continuous monitoring through tele-home health can detect early warning signs in chronic diseases, allowing patients and their relatives to be trained on medicine use, nutrition, and physical activity practices.[13] Tele-home health has been found to have positive effects on patient clinical outcomes by reducing readmissions, emergency department visits, and mortality, while also strengthening patients' self-management and increasing their sense of safety and security.[13,15,16,21] Furthermore, telehealth improves communication and information sharing between patients, healthcare professionals, and healthcare institutions, leading to better decision-making and reduced costs.[14] Additionally, telehealth can reduce the patient's traveling burden and provide access to services outside clinic hours.[15]

An article published in the Lancet in the 1870s mentioned the advantages of telehealth, demonstrating that its discovery is not new. However, current health system conditions and the advantages obtained with the use of telehealth have increased its utilization.[11] The growing use of telehealth in home health services is expected to lead to an increase in research studies within this context. It is also anticipated that the challenges, benefits, and obstacles encountered during the implementation process will be reflected in these studies over time. This research aims to track the evolution of various perspectives, findings, and results on the subject as time progresses. This study aims to examine the use of telehealth in home health services through bibliometric analysis. This allows researchers to track the literature's development, evaluate the quality of published studies, and identify the main themes of the research. The findings can provide a reference for researchers and health management professionals to improve the quality and efficiency of home health services.

Method

In this retrospective study, data obtained from the Web of Science database were utilized. The study does not require approval from an ethics committee, as it is retrospective and informed consent is not required.

Statistical analysis

Bibliometric methods involve analyzing the studies published on a specific subject numerically. It helps researchers reveal the performance analysis or scientific mapping of publications on a subject.[22]

The Web of Science (WoS) database is commonly used in bibliometric studies due to its comprehensive coverage of publications from various disciplines. The data for the study was obtained from the WoS Core Collection database on 10.08.2024, with no year restrictions in the search. Only English language publications, including 'article', 'review article', and 'early access' publications were selected, while book chapters, congress proceedings, and other non-article publications were excluded. The search used the keywords 'homecare' OR 'home healthcare' OR 'hospital in the home' AND 'telehealth' OR 'remote'.

The data was analyzed using VOSviewer 1.6.18 and SciMAT 1.1.06 software.[23] Publications were analyzed in terms of author, country, number of citations, keywords, index, year of publication, and research area. The period from 1985 to 2024 was divided into four periods, and a strategic diagram analysis was conducted for these periods.

Results

Since 1985, a total of 3197 publications have been produced. Of these, 2810 are articles, 384 are review articles, and 83 are in early access.

When we categorize the publications based on the type of index, we find that 76.7% of them are within the Science Citation Index Expanded (SCI-Expanded), 35.3% are within the Social Sciences Citation Index (SSCI), 17.2% are within the Emerging Sources Citation Index (ESCI), and 0.1% are within the Arts & Humanities Citation Index (A&HCI).

The majority of publications in the research area were in the fields of Health Care Sciences Services (n=855), Engineering (n=415), and Computer Science (n=376). This indicates that the subject is multidisciplinary, with studies conducted in various fields including the health sector (such as Nursing, General Internal Medicine, and Cardiovascular System Cardiology), informatics (Medical Informatics, ScienceTechnology Other Topics, Telecommunications), and business (BusinessEconomics).

The first publication in the field of research was made in 1985. The number of publications has been increasing over the years, especially after 2010, there has been a rapid increase in the number of publications. The increase in the number of publications has gained momentum since 2018 (Figure 1).

There are publications from 91 countries in total. The top three countries with the highest number of publications are USA, Australia and England. Türkiye ranks 19th with a total of 49 publications (Figure 2).

When the number of citations of publications by countries was analysed, it was seen that 6 countries were not cited at all. The 5 most cited countries were USA (27,591), Australia (5,916), Canada (5,192), Peoples R China (5,133) and England (4,711). Compared to other countries, it is seen that the publications produced in the USA are dominant in terms of citation (Figure 3).

A total of 13,588 authors were identified. When ranking the authors, we considered at least 1 publication and at least 1 citation. It was found that 11,522 authors met these criteria. Table 1 displays the top five authors with the highest number of publications, along with their respective publication and citation counts.

It was found that 503 of the publications included in the research were not cited at all. When the search was narrowed down to studies with at least 5 citations, 1,895 publications meeting this criterion were identified. Table 2 presents detailed information about the top 5 most cited studies.[24-28]

A total of 7,043 keywords were used in the studies. The keywords were scanned, with 5 or more keywords meeting the criteria identified. A total of 419 keywords met this criterion. The top five most

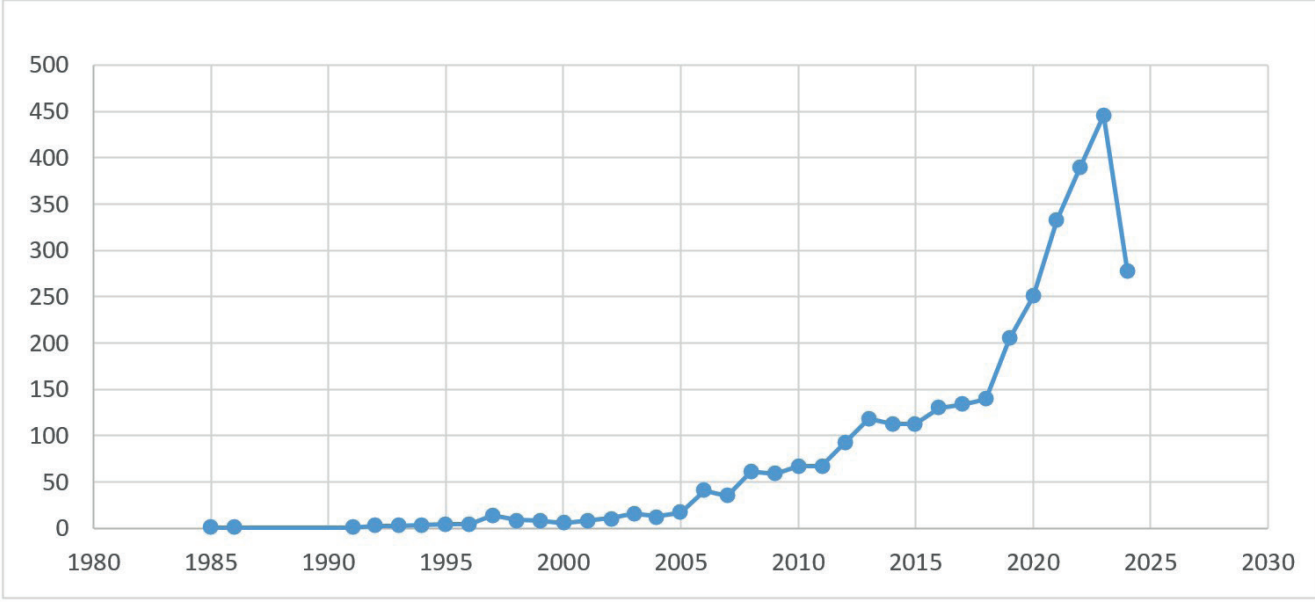

Figure 1. Number of publications (5-year periods)

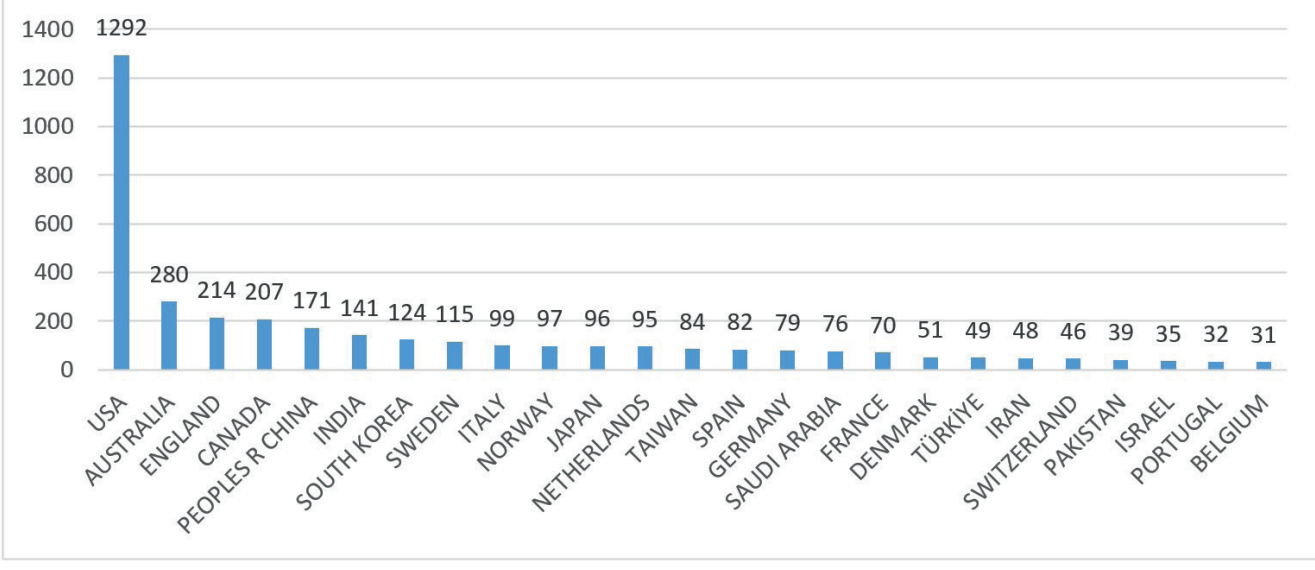

Figure 2. Top 25 Countries with the most publications

frequently used keywords, without discrimination according to years, are shown in Table 3.

The analysis of the keywords used is depicted in Figure 4. There is a strong relationship between the keywords "telehealth," "telemedicine," and "home health monitoring," which are sometimes used interchangeably in the literature. "Remote patient monitoring" and "COVID-19" are also prominent keywords. The keywords "blood pressure," "arrhythmia," and "vital signs" are associated with the keyword "remote patient monitoring."

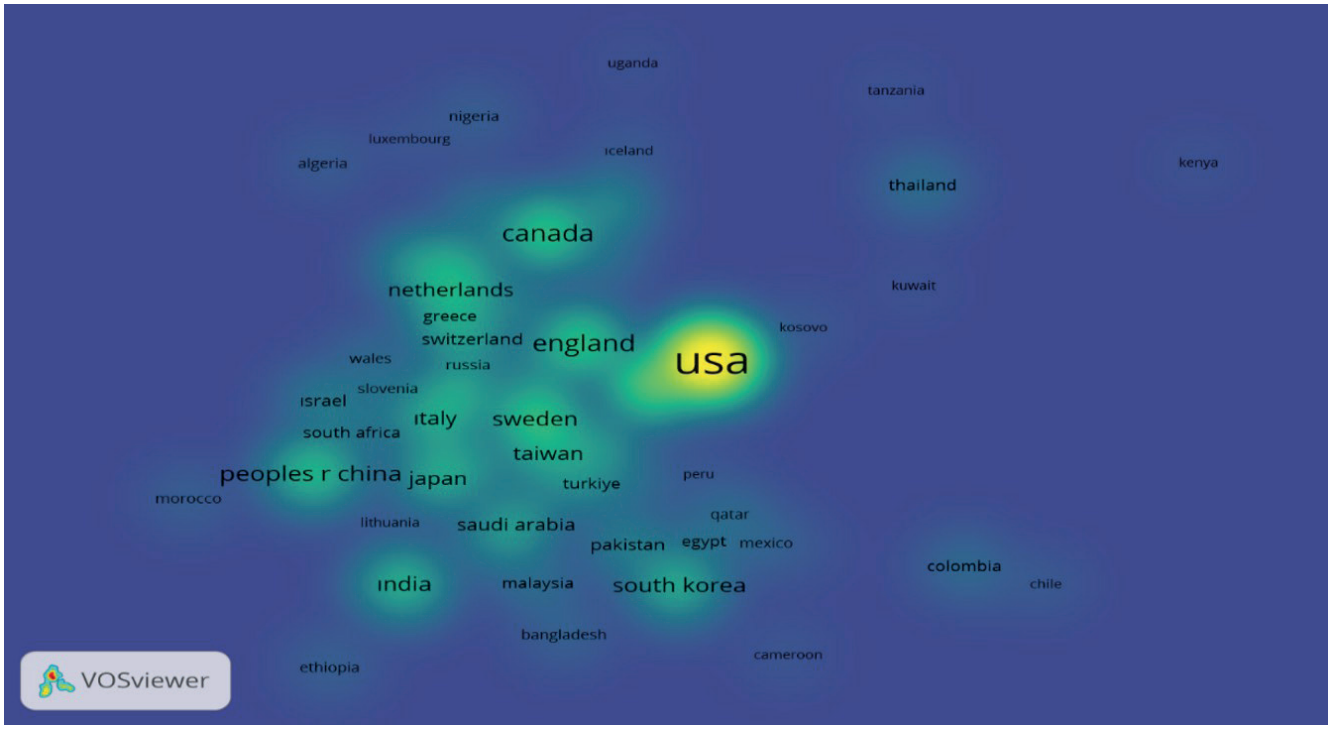

Figure 3. Most cited countries

Table 1. Top 5 authors with the most publications

Author(s)	Publications (n)	Total Citations (n)
Bowles, KH	21	218
Topaz, M	18	111
Montalto, M	18	323
Najafi, B	18	211
Zhang, Y	17	551

Table 2. The Most influential publications (top 5) [24-28]

Rank	The Most Influential Publications	Citation (n)
1	Mann DM, Chen J, Chunara R, Testa PA, Nov O. COVID-19 transforms health care through telemedicine: evidence from the field. J Am Med Inform Assoc. 2020;27(7):1132-1135	835
2	Ekeland AG, Bowes A, Flottorp S. Effectiveness of telemedicine: a systematic review of reviews. Int J Med Inform. 2010;79(11):736-771.	676
3	Ong MK, Romano PS, Edgington S, et al. Effectiveness of remote patient monitoring after discharge of hospitalized patients with heart failure: the better effectiveness after transition–heart failure (BEAT-HF) randomized clinical trial. JAMA Intern Med. 2016;176(3):310-318.	429
4	Yang G, Xie L, Mäntysalo M, et al. A health-IoT platform based on the integration of intelligent packaging, unobtrusive bio-sensor, and intelligent medicine box. IEEE Trans Ind Inform. 2014;10(4):2180-2191.	378
5	Almathami HKY, Win KT, Vlahu-Gjorgievska E. Barriers and facilitators that influence telemedicine-based, real-time, online consultation at patients' homes: systematic literature review. J Med Internet Res. 2020;22(2):e16407.	370

Table 3. The 10 most frequently used keywords

Rank	Most Frequent Keywords	Cited (n)
1	Telehealth	414
2	Telemedicine	406
3	Remote Patient Monitoring	402
4	Home Healthcare	238
5	Home Health Monitoring	157
6	Covid-19	133
7	E-Health	110
8	Home Care	93
9	Heart Failure	86
10	Digital Health	80

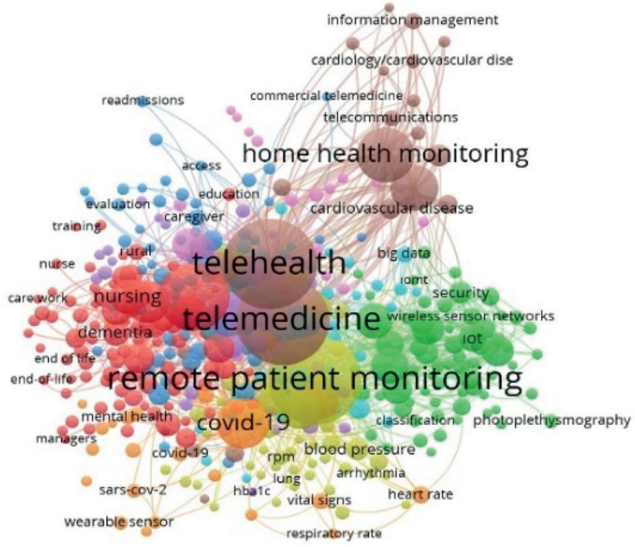

Figure 4. Most frequently used keywords

The most cited studies are shown in Figure 5. Accordingly, Mann (2020), Almathami (2020), Yang (2014) are the most cited studies.

In the study, the publications on the subject were analysed by dividing them into four periods. The periods were determined as follows.

- 1st Period is between the years 1986-2000
- 2nd Period is between the years 2001-2010
- 3rd Period is between the years 2011-2020
- 4th Period is between the years 2021-2024

In Figure 6, it is evident that 68 keywords were used in the initial period, and 60 of these were also used in the subsequent period. The total count of keywords reached 284, with 224 new keywords introduced in the second period. For the third

Figure 5. Most cited publications

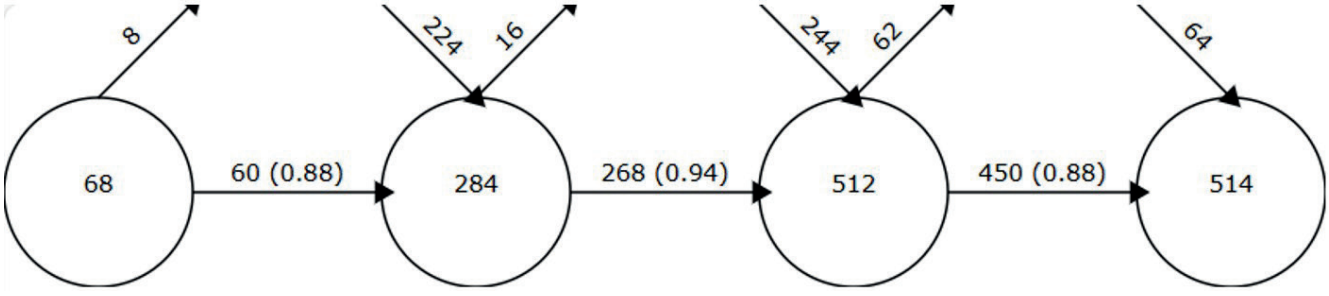

Figure 6. Keywords for the periods

and fourth periods, the number of keywords used exceeded five hundred.

Homecare, which is the main field of study in the first period, has a centrality value of 76.52 and a density value of 98.56. In this period, the homecare theme constitutes the research centre. Themes that are important for the research area but need to be developed are found to be care and therapy themes. The more specialised topics that the methodology used labelled as 'peripheral' are preterm-infant, outpatientcare and hospice. In the lower left quadrant is ECG (electrocardiogram), which has low centrality and density. When the strategic diagram of the second period is analysed, the increase in the number of themes is noteworthy. In this period, the clusters on the top right with high centrality and density are diabetes care (c=149.88, d=68.74) and aging people (c=182.01, 35.25). Themes that need to be developed are nurse, cost, stroke and risk. Special themes include continious-infusion, electronic-health-record, patient-safety and atrial-fibrillation. Emergency-department, adolescent-health, intelligent-agent and acces have low density and centrality (Figure 7).

In the third period, the main themes were telehealth (c=147,01, d=25,36), dementia (c=132,41, d=11,61), wearable device (c=66,96, d=18,09), and palliative care (c=89,37, d=5,36). Rehabilitation, palliative-care, monitoring-system and care-coordination clusters were found as themes that need to be developed. In the upper left corner of the diagram, rouing-protocol, kidney-disease, constrain and robot clusters are seen. In the lower left corner, community-care, atrial-fibrillation, blood-glucose clusters are present. In the fourth period, internet of things with 75.23 centrality and 14.43 heart values, elderly and caregiver with 108.96 centrality and 9.11 densities (c=84.56, d=12.26) stand out. In this period, wearable-device, therapy, cancer, nursing themes are important for the research topic but need to be developed. More specific themes include movement-disorder, hearth-beat. The themes of the fourth period with low centrality and intensity are home-nursing, coordination, contacless and vaccine (Figure 8).

The cluster networks of the keywords in the center during the periods examined are shown in Figure 9. Specifically, the word "Homecare" has a strong relationship with the words "telemedicine" and "telecommunication". "Diabetes care" is strongly related to "preventable hospitalization" and "disparities". There is a strong relationship between the aging people theme with the late-life and public-health themes and between the primary-care theme and the functional-health theme (Figure 9).

The relationship between telehealth and telemedicine; dementia and informal-care, lived-experince themes were found to be strong. Figure 10 show the network maps of wearable-device and palliative-care themes.

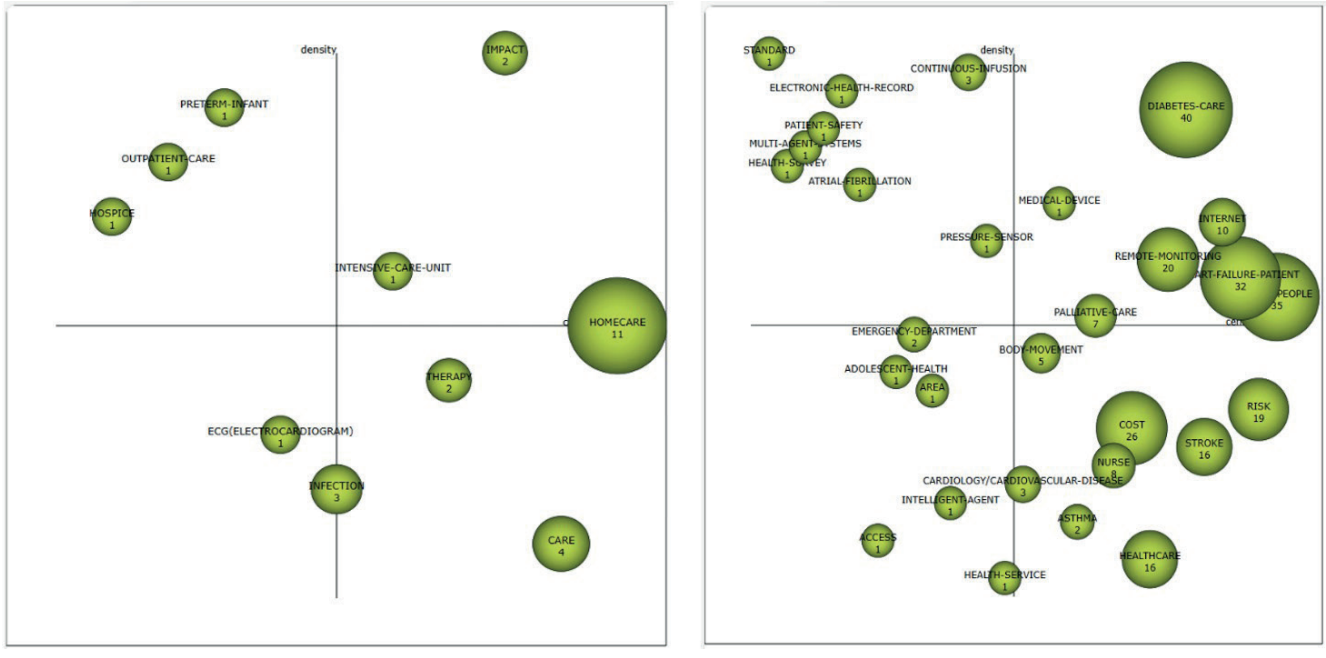

Figure 7. Strategic map for the period 1986-2000 and period 2001-2010

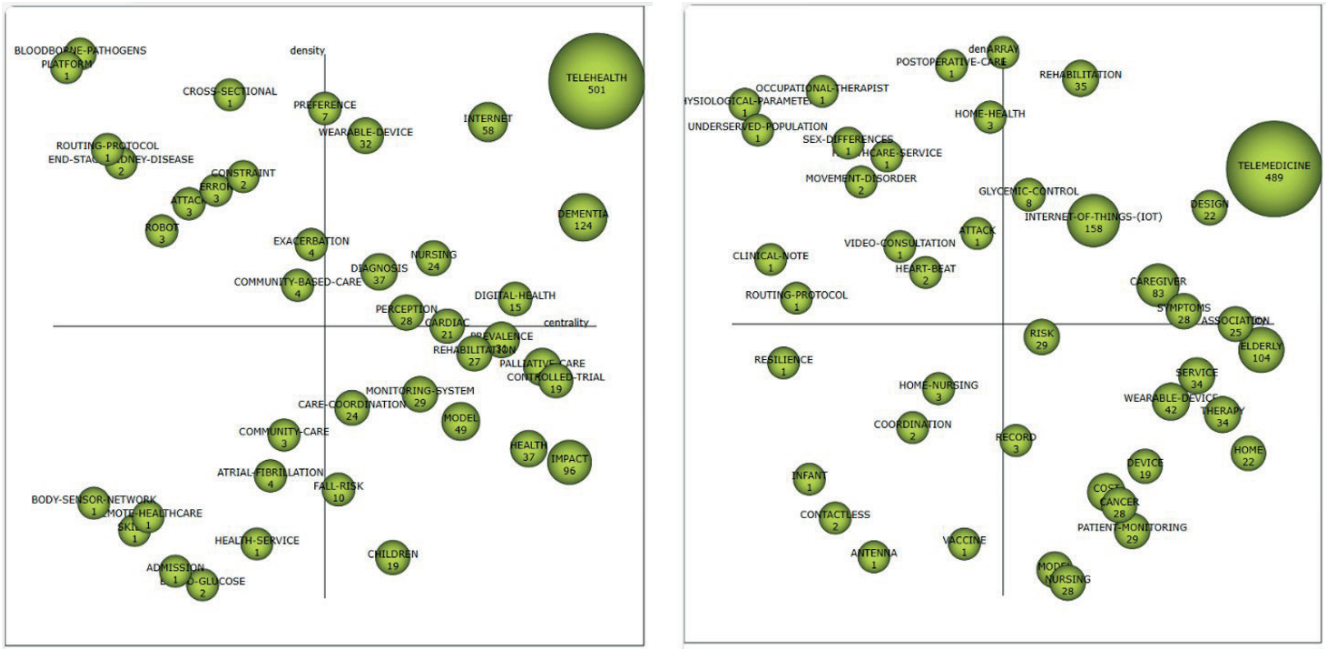

Figure 8. Strategic map for the period 2011-2020 and period 2021-2024

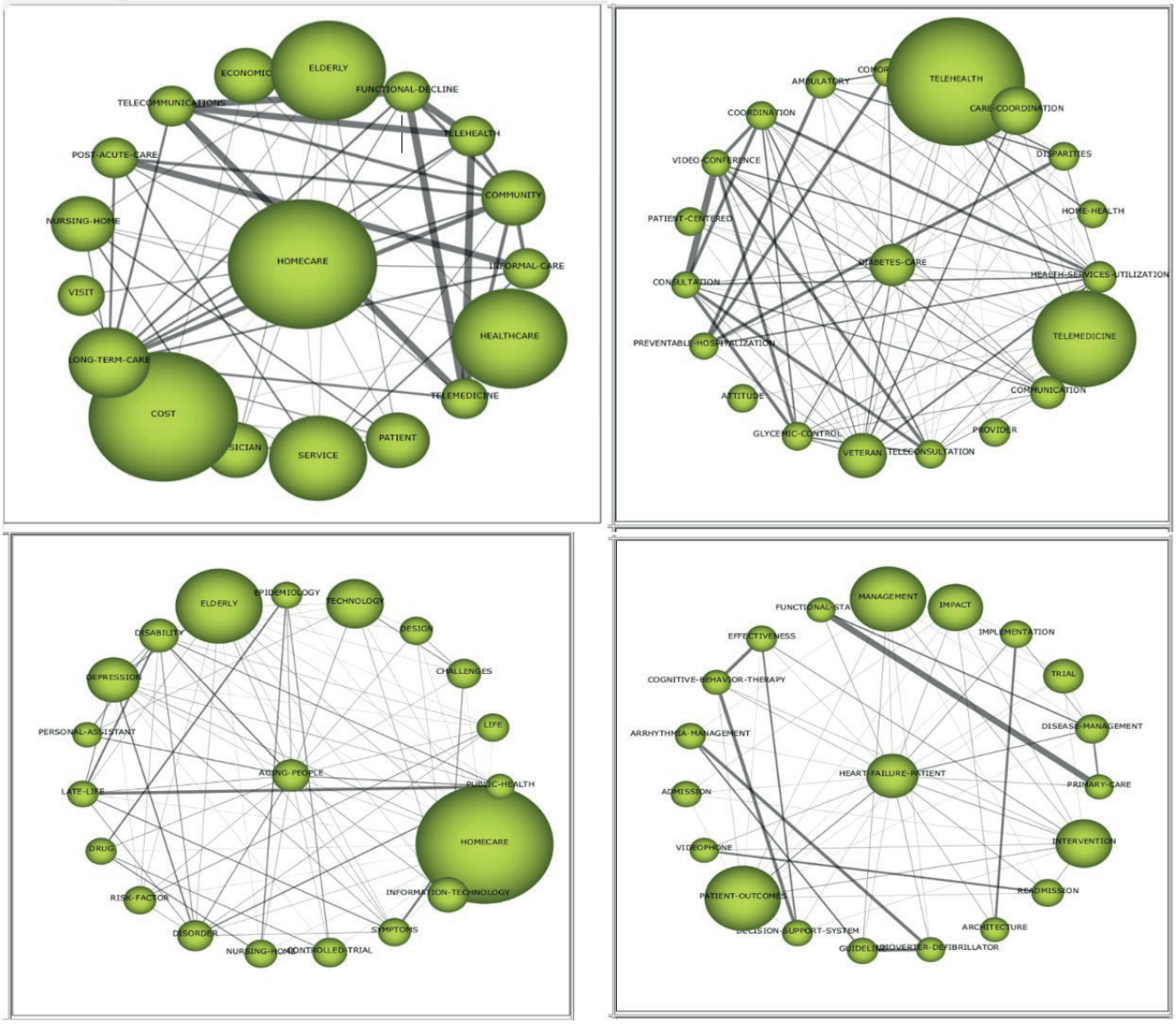

Figure 9. Network map of homecare, diabetes-care, aging-people and heart-failure

The network maps showing the relationship between the internet-of-things, elderly and caregiver themes, which are the main themes of the fourth period, and other themes are presented in Figure 11.

The scientific map illustrated in Figure 12 demonstrates the evolution and interconnections of scientific concepts throughout specific periods related to the study topic. By pinpointing which concepts are prominent in various years, this analysis provides a deeper understanding of conceptual evolution through time series analysis. This longitudinal analysis allows researchers to understand how literature has evolved over time and provides a comprehensive view. While all developmental phases are important, the first period analyzed is particularly significant as it shows the studies that sparked interest in the subject, while the last period offers insight into current research. The columns from left to right represent the periods from the first to the fourth,

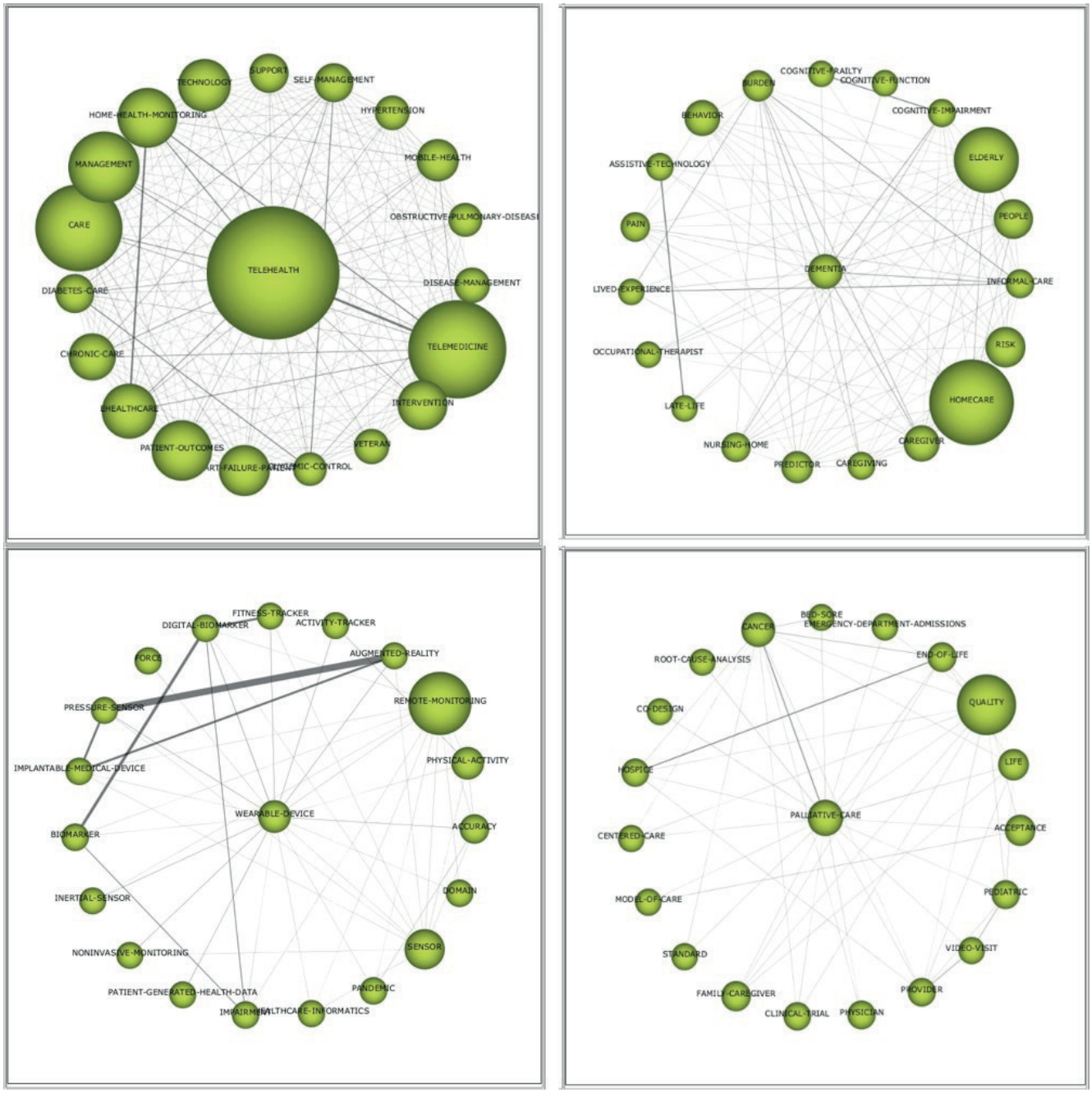

Figure 10. Network map of wearable device, palliative-care, telehealth and dementia

respectively. In the first period (1986-2000), the prominent themes are homecare, impact, care, infection, and preterm-infant. There appears to be a generally weak connection between the themes of the first and second periods. In the second period, the themes shift to internet, diabetes care, aging people, heart failure patient, risk, and stroke. Notably, there is a distinct relationship between cost and homecare, the main theme of the first period. This may be attributed to the focus on the cost-effectiveness of home health services in the early studies. Moving on to the third period, the primary themes include telehealth, dementia, wearable device, internet, and palliative care. In

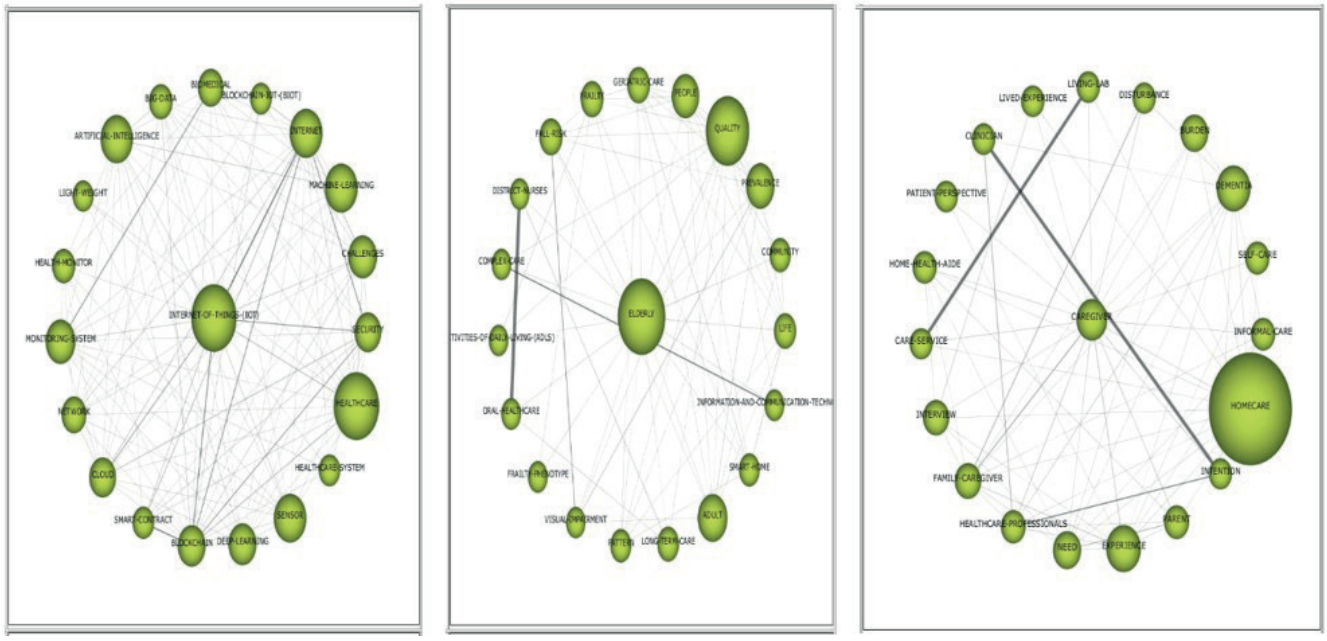

Figure 11. Network map of Internet-of-things, elderly and caregiver

the last period, the focus shifts to telemedicine, internet of things, caregiver, elderly, and wearable device. It is evident that IoT, patient monitoring, wearable devices, and data management have been increasingly prominent in recent years and are expected to continue growing in the future. Also, an interesting observation is the noticeable link between the themes of dementia and caregiver in the third and fourth periods, as depicted in Figure 12.

Discussion

In this study, it is examined the studies on the use of telehealth in home health services published in Web of Science using bibliometric analysis. A total of 3,197 publications have been accessed from 1986 to the present. The analysis indicates that the number of publications has increased significantly since 2010 and this increase has gained momentum since 2018. The widespread use of the Internet and technological advancements, particularly the rapid development of information communication technologies such as wireless devices and smartphones, have been influential in the advancement of telehealth applications.[29] As mentioned by Farias et al., the rise in the number of publications is closely linked to technological developments.[30]

The analyzed studies has been evaluated in four periods. According to the analysis of the first period (1986-2000), the most prevalent themes are homecare and cost. Cost-effectiveness is considered one of the major benefits in the emergence of both home health and telehealth services.[2,3,31] In contrast to more expensive hospital-centered health service delivery, home health service delivery is a more cost-effective method due to services being delivered at home.[7] Telehealth has the potential to impact costs by eliminating the cost of travel, shifting care from clinicians to technology, or enhancing patient self-management.[32] It is reasonable to address the cost in the initial studies on the subject.

There are studies on care models based on smart technologies for the elderly and individuals with chronic diseases. These studies involve using

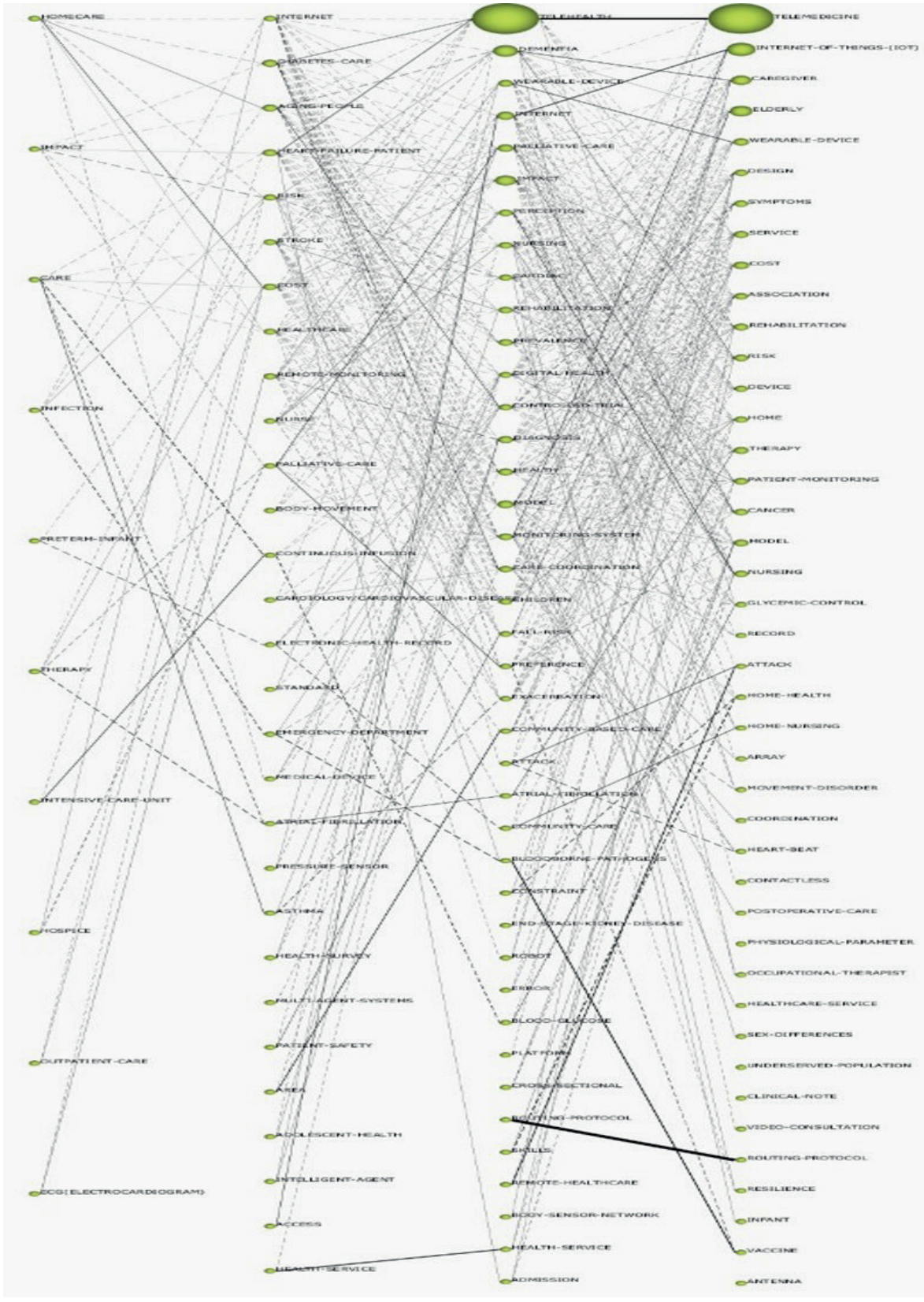

Figure 12. Longitudinal analysis regarding themes of the periods

telehealth applications to support various clinical conditions such as congestive heart failure, chronic obstructive pulmonary disease, diabetes, and chronic kidney disease.[12,21] Telemonitoring, a type of telehealth, is seen as promising, especially in the management of chronic diseases. Many studies in the literature investigate the economic, clinical, structural, and behavioral effects of remote monitoring of individuals with chronic diseases.[30]

Palliative care aims to alleviate the severe symptoms of patients with life-threatening diseases and improve the patient's quality of life. Patients receiving palliative care often want to live as normal a life as possible until the last day of their lives and maintain their social ties. Most palliative care patients prefer to receive care in their own homes. In recent years, palliative care models have adopted a patient-centered approach, taking into account the patient's preferences.[16,18] Recently, studies using telehealth have been carried out to follow up patients in need of palliative care at home and to meet their health needs.[14]

Informal caregivers play an important role in meeting the care needs of elderly and chronically ill individuals.[33] Telehealth applications are also used for programs for caregivers beyond patient follow-up. Services can be provided by telephone or over the internet to offer training, information, or psychosocial support for caregivers.[8,34] It is stated that distance education materials can improve the knowledge and skills of caregivers in caring for individuals with chronic diseases and dementia patients.[34-37] Recently, projects and studies on this subject have been increasing in the literature.

Remote patient monitoring technologies help to bring medical health services to the patient's home. Today, wearable devices, sensors, and advanced communication technology allow for long-term and continuous monitoring, instantly transmitting patient findings to healthcare providers.[1] Technological developments such as the Internet of Things (IoT), cloud computing, and artificial intelligence offer cheaper, more inclusive, and more innovative healthcare solutions. These technological advances lead to smart home care.[12] The increasing interest in wearable devices and the Internet of Things has made these topics among the main themes of recent periods.

Limitations

This study has a few limitations. Firstly, it only includes studies published in the English language and available in the Web of Science database. Secondly, it is limited to studies that can be accessed using specific keywords. It's important to note that there may be other relevant studies that were not included, particularly those published in different languages and in databases other than Web of Science.

Conclusion

Home health services have been available for many years. However, the aging population and the rising number of individuals with chronic diseases have led to an increased demand for home health services. The recent COVID-19 pandemic has further emphasized the need for home healthcare services. Additionally, the shift towards patient-centered care has played a vital role in moving healthcare services to the home. The advancement in health and communication technology has integrated home health service delivery and telehealth. Through bibliometric analysis, this study demonstrates that telehealth has become more prevalent in home health services due to technological advancements. Moreover, there is growing interest in providing follow-up and treatment for individuals with chronic diseases and patients in need of palliative care at home, reflecting the impact of patient-centered service delivery.

Ethical approval

The study does not require ethics committee approval.

Author contribution

The authors declare contribution to the paper as follows: Study conception and design: ÖG; data collection: ÖG; analysis and interpretation of results: ÖG; draft manuscript preparation: ÖG. All authors reviewed the results and approved the final version of the article.

Source of funding

The authors declare the study received no funding.

Conflict of interest

The authors declare that there is no conflict of interest.

References

1. Lanata A. Wearable systems for home monitoring healthcare: the photoplethysmography success pros and cons. Biosensors (Basel). 2022;12(10):861. **[Crossref]**
2. Lawrence J, Truong D, Dao A, Bryant PA. Virtual hospital-level care-feasibility, acceptability, safety and impact of a pilot hospital-in-the-home model for COVID-19 infection. Front Digit Health. 2023;5:1068444. **[Crossref]**
3. Chua CMS, Ko SQ, Lai YF, Lim YW, Shorey S. Perceptions of hospital-at-home among stakeholders: a meta-synthesis. J Gen Intern Med. 2022;37(3):637-650. **[Crossref]**
4. Heratanti N, Rambi AP, Syarifurrahman I. The telehealth effectiveness in home care services: a systematic review. STRADA Jurnal Ilmiah Kesehatan. 2021;10(1):1057-1065.
5. Chen PJ, Smits L, Miranda R, et al. Impact of home healthcare on end-of-life outcomes for people with dementia: a systematic review. BMC Geriatr. 2022;22(1):80. **[Crossref]**
6. Türkiye Sağlık Enstitüleri Başkanlığı, Türkiye Halk Sağlığı ve Kronik Hastalıklar Enstitüsü, İstanbul İl Sağlık Müdürlüğü Kamu Hastaneleri Hizmetleri Başkanlığı. Evde Sağlık Hizmetleri Raporu. İstanbul; 2021. Available at: https://files.tuseb.gov.tr/tuseb/files/yayinlar/20230703121545-LpXSrYTMDQ8R-.pdf
7. Roberts N, Carrigan A, Hibbert P, et al. Consumer and provider perspectives on hospital in the home: a qualitative study. Health Soc Care Community. 2023;2023:7105751. **[Crossref]**
8. Ahn S, Romo RD, Campbell CL. A systematic review of interventions for family caregivers who care for patients with advanced cancer at home. Patient Educ Couns. 2020;103(8):1518-1530. **[Crossref]**
9. Becqué YN, Rietjens JAC, van der Heide A, Witkamp E. How nurses support family caregivers in the complex context of end-of-life home care: a qualitative study. BMC Palliat Care. 2021;20(1):162. **[Crossref]**
10. Senillosa MB, Saimovici J, Mandirola Brieux HF, et al. Mobile application for home healthcare: physician's expectations and perceptions. Stud Health Technol Inform. 2022;290:197-199. **[Crossref]**
11. Mundi MS, Mohamed Elfadil O, Bonnes SL, Salonen BR, Hurt RT. Use of telehealth in home nutrition support: challenges and advantages. Nutr Clin Pract. 2021;36(4):775-784. **[Crossref]**
12. Fang KY, Ginige JA, Basilakis J, Bjering H, Javadi B. Smart homecare research translation into broader practice: enablers, barriers and directions. IEEE Access. 2022;10:134726-134743. **[Crossref]**
13. Liang HY, Hann Lin L, Yu Chang C, Mei Wu F, Yu S. Effectiveness of a nurse-led tele-homecare program for patients with multiple chronic illnesses and a high risk for readmission: a randomized controlled trial. J Nurs Scholarsh. 2021;53(2):161-170. **[Crossref]**
14. Oelschlägel L, Christensen VL, Moen A, et al. Patients' experiences with a welfare technology application for remote home care: a longitudinal study. J Clin Nurs. 2023;32(17-18):6545-6558. **[Crossref]**
15. Steindal SA, Nes AAG, Godskesen TE, et al. Patients' experiences of telehealth in palliative home care: scoping review. J Med Internet Res. 2020;22(5):e16218. **[Crossref]**
16. Lundereng ED, Nes AAG, Holmen H, et al. Health care professionals' experiences and perspectives on using telehealth for home-based palliative care: scoping review. J Med Internet Res. 2023;25:e43429. **[Crossref]**

17. Oelschlägel L, Moen A, Dihle A, et al. Implementation of remote home care: assessment guided by the RE-AIM framework. BMC Health Serv Res. 2024;24(1):145. **[Crossref]**

18. Steindal SA, Nes AAG, Godskesen TE, et al. Advantages and challenges of using telehealth for home-based palliative care: systematic mixed studies review. J Med Internet Res. 2023;25:e43684. **[Crossref]**

19. Brocard E, Antoine P, Mélihan-Cheinin P, Rusch E. COVID-19's impact on home health services, caregivers and patients: lessons from the French experience. Lancet Reg Health Eur. 2021;8:100197. **[Crossref]**

20. Ruíz-Fernández MD, Fernández-Medina IM, Gálvez Ramírez F, Granero-Molina J, Fernández-Sola C, Hernández-Padilla JM. Experiences of home care nurses during the COVID-19 pandemic. Nurs Res. 2022;71(2):111-118. **[Crossref]**

21. Pogorzelska-Maziarz M, Rising KL, Gentsch AT, et al. Home healthcare patient, caregiver and provider perspectives on use of unscheduled acute care and the usability and acceptability of on-demand telehealth solutions. Geriatr Nurs. 2021;42(5):1029-1034. **[Crossref]**

22. Öztürk N, Kurutkan MN. Examination of quality management with bibliometric analysis method. Journal of Innovative Healthcare Practices. 2020;1(1):1-13.

23. Cobo MJ, López-Herrera AG, Herrera-Viedma E, Herrera F. SciMAT: a new science mapping analysis software tool. J Am Soc Inf Sci Technol. 2012;63(8):1609-1630. **[Crossref]**

24. Mann DM, Chen J, Chunara R, Testa PA, Nov O. COVID-19 transforms health care through telemedicine: evidence from the field. J Am Med Inform Assoc. 2020;27(7):1132-1135. **[Crossref]**

25. Ekeland AG, Bowes A, Flottorp S. Effectiveness of telemedicine: a systematic review of reviews. Int J Med Inform. 2010;79(11):736-771. **[Crossref]**

26. Ong MK, Romano PS, Edgington S, et al. Effectiveness of remote patient monitoring after discharge of hospitalized patients with heart failure: the better effectiveness after transition–heart failure (BEAT-HF) randomized clinical trial. JAMA Intern Med. 2016;176(3):310-318. **[Crossref]**

27. Yang G, Xie L, Mäntysalo M, et al. A health-IoT platform based on the integration of intelligent packaging, unobtrusive bio-sensor, and intelligent medicine box. IEEE Trans Ind Inform. 2014;10(4):2180-2191. **[Crossref]**

28. Almathami HKY, Win KT, Vlahu-Gjorgievska E. Barriers and facilitators that influence telemedicine-based, real-time, online consultation at patients' homes: systematic literature review. J Med Internet Res. 2020;22(2):e16407. **[Crossref]**

29. Baumann PK, Scales T. History of information communication technology and telehealth. Academy of Business Research Journal. 2016;3:48-52.

30. Farias FAC, Dagostini CM, Bicca YA, Falavigna VF, Falavigna A. Remote patient monitoring: a systematic review. Telemed J E Health. 2020;26(5):576-583. **[Crossref]**

31. Megido I, Sela Y, Grinberg K. Cost effectiveness of home care versus hospital care: a retrospective analysis. Cost Eff Resour Alloc. 2023;21(1):13. **[Crossref]**

32. Snoswell CL, Taylor ML, Comans TA, Smith AC, Gray LC, Caffery LJ. Determining if Telehealth Can Reduce Health System Costs: Scoping Review. J Med Internet Res. 2020;22(10):e17298. **[Crossref]**

33. Chase JD, Russell D, Kaplan DB, Bueno MV, Khiewchaum R, Feldman PH. "Doing the Right Thing": family caregivers managing medical and nursing tasks in the postacute home health care setting. J Appl Gerontol. 2021;40(12):1786-1795. **[Crossref]**

34. Sitges-Maciá E, Bonete-López B, Sánchez-Cabaco A, Oltra-Cucarella J. Effects of e-Health Training and Social Support Interventions for Informal Caregivers of People with Dementia-A Narrative Review. Int J Environ Res Public Health. 2021;18(15):7728. **[Crossref]**

35. Adashek JJ, Subbiah IM. Caring for the caregiver: a systematic review characterising the experience of caregivers of older adults with advanced cancers. ESMO Open. 2020;5(5):e000862. **[Crossref]**

36. Klimova B. Exploring eLearning for Dementia Care. In: Park JJ, Yang LT, Jeong YS, Hao F, editors. Advanced Multimedia and Ubiquitous Engineering. Springer; 2019. **[Crossref]**

37. Scott AF, Ayers S, Pluye P, et al. Impact and Perceived Value of iGeriCare e-Learning Among Dementia Care Partners and Others: Pilot Evaluation Using the IAM4all Questionnaire. JMIR Aging. 2022;5(4):e40357. **[Crossref]**

Turk J Fam Pract 2025;29(1):36-40
DOI: 10.54308/TJFP.2025.834

Review

Educational family health centers and overview of the regulation

Baki Derhem[1], Laçin Aksoy[2]

[1]Department of Family Medicine, Faculty of Medicine, Kırıkkale University, Kırıkkale, Türkiye
[2]Family Health Center No. 30, Pendik, İstanbul, Türkiye

ABSTRACT

Family medicine is a specialty with its own research topics, training curriculum and clinical functioning. The first step toward the implementation of the expected field trainings was taken in 2014, and training family health centers started to be established.

The regulation has been revised in order to solve problems encountered in practice, to protect the public interest, to meet service needs and to encourage educational family health centers. In addition, it was considered necessary to expand the use of educational family health centers where family medicine specialty students are trained in the field. These regulations have been harmonized with the changes in family medicine legislation. As a result, the "Regulation on Training Family Health Centers" was published in the Official Gazette dated 28.04.2023 and numbered 32174 and entered into force. The aim of this article is to provide an overview of educational family health centers and to evaluate the revised regulation.

Keywords: education, general practice, legislation, regulation

Introduction

Definition of family medicine and the specialization process

Family medicine is a primary health care service provided by specialist physicians who provide continuous and comprehensive care to everyone in need of medical care, regardless of the patient's age, gender and disease, without discrimination; provide services in accordance with the family, society and culture of individuals; advocate for health; respect their personalities; observe ethical values; and demonstrate an attitude in accordance with the principles of the discipline of family medicine. The World Organization of Family Doctors (WONCA) has identified six core competencies and twelve essential skills that every family physician should master, regardless of the health systems in which they practice. Primary care management, person-centered care, specific problem-solving skills, comprehensive approaches, community orientation and holistic modeling are the basic competencies that form the framework of the family medicine discipline.[1]

In our legislation, a family physician is defined as a family medicine specialist who is obliged to provide preventive health services and primary diagnosis, treatment and rehabilitative health services to

✉ Baki Derhem ▪ dr.baki71@gmail.com
Received: 10.02.2025 **Accepted:** 11.03.2025 **Published:** 26.03.2025

each person comprehensively and continuously in a specific place without discrimination of age, gender and disease; who provides mobile health services to the extent necessary and works on a full-time basis; or who is a specialist physician or physician who receives the training required by the authority.[2]

In Türkiye, family medicine specialization was first included in the Medical Specialization Regulation in 1983. In 1985, specialty training started in training and research hospitals in Ankara, Izmir and Istanbul, and in 1993, the Department of Family Medicine was established at Trakya University and started residency training.[3]

Content of family medicine specialty training

Family medicine is a specialty with its own research topics, training curriculum and clinical functioning. The Curriculum Creation and Standard Setting Commission of the Board of Medical Specialization has set out the aim of family medicine specialty education as providing appropriate opportunities for the development of clinical knowledge, skills, attitudes and behaviors as well as the ability to provide health education, research and management qualities in line with the basic principles within the definition of family medicine.[4] Family medicine training differs from the training of other specialties in many aspects. During the education process, it is necessary to adapt to disciplines in a short period of time through the rotation of many different departments. While other specialties train specialists to provide health services in secondary and tertiary care, family medicine specialization graduates specialists to provide primary health care services. The duration of education varies from country to country, but in Türkiye, it is 3 years. Until 2009, family medicine residency training consisted entirely of rotations; however, the Medical Specialty Committee shortened this period to 18 months and included Educational Family Health Centers (EFHC) among the places where the remaining 18 months would be spent.

The EFHCs have been considered by family medicine clinicians to be the most appropriate training environment for on-the-job, structured clinical training supported by evaluation and feedback, where the trainer can be a role model, where reflection and case discussions can be held, and where public education, management and inter-institutional cooperation can be learned.[5]

Historical process of regulating education in family health centers

In Türkiye, family medicine practices started as a pilot in Düzce Province in 2005 and were implemented in all provinces in 2010. The “Law on Family Medicine”, which is the main basis for implementing regulations, was published in 2004 (OG: 09.12.2004--25665).[6] After three years spent in the family medicine outpatient clinics of universities and training and research hospitals providing specialty training and in the necessary rotations, the graduating specialty students took a long time to adapt to primary care when they started working in the field and found themselves in situations they encountered for the first time in many ways. The first step toward the implementation of the expected field trainings was the abrogated “Regulation on Payment and Contracts for Educational Family Health Centers” published in 2014 (OG: 26.09.2014--29131).[7]

Following the entry into force of the regulation, EFHCs began to be established by various educational institutions, and by March 2019, twenty-five EFHCs had been opened by a total of seventeen different educational institutions.[8] A number of negative circumstances, such as technical problems and problems in correcting them, difficulties in assigning personnel, and legislative impasses in the use of the money transferred by the ministry to the educational institution, have caused educational institutions and provincial

health directorates to approach the issue of opening an EFCH with hesitation.[5]

For reasons such as solving the problems encountered in practice, the public interest, service needs and encouraging the opening of educational family health centers and expanding the training that family health centers where family medicine assistants/research assistants receive field training and updating the regulation by making it compatible with the regulations made in family medicine legislation, it has become necessary to revise and reorganize the regulation. At the same time, the "Regulation on Educational Family Health Centers", which was created by gathering together the provisions on educational family health centers, which were found in pieces in other family medicine legislation, entered into force after being published in the official gazette dated 28.04.2023 and numbered 32174.[9]

Examination of the regulation of educational family health centers

The purpose of this regulation, which has been prepared on the basis of the ninth paragraph of Article 3 of the Law on Family Medicine and Articles 352, 361 and 508 of Presidential Decree No. 1, is to determine the principles of contract and payments to be made to trainers, assistants, family health personnel and training institutions who take part in the provision of family medicine services in training family health centers or training family medicine units by signing an institutional contract.

The first notable change in the regulation is the addition of city hospitals, which are hospitals providing services through the public-private partnership model, to the definitions in Article 4. This paved the way for city hospitals to provide specialty training to open educational family health centers.

The eighth section of the Family Medicine Implementation Regulation was completely removed and included in the Regulation on Educational Family Health Centers as Article 5, with significant changes. Important changes and additions have been made here, and there is no longer a need for a contract between the ministry-affiliated hospitals and the institution, and educational family health centers can now be opened directly by the ministry. Moreover, in terms of establishing service venues, the new regulation adds that provincial health directorates can also establish venues and that they can be operated by the directorate. While the previous regulation stated that available family medicine units would be evaluated upon the request of the institution, the new regulation obliges provincial health directorates to first offer vacant or newly opened units to the training institution. Thus, it aims to prevent the problems experienced by educational institutions in keeping track of new units opened or vacant within the province.

The difficulties in collecting data from the registered population have led to the closure of many units. To prevent this situation, Article 5, Paragraph 15 of the regulation stated, "In accordance with the first sentence of the first paragraph of Article 5 of the Law on Family Medicine, provided that the right of individuals to change their family physicians is reserved, individual or collective family medicine person registration or registration changes can be made to training family medicine units on the basis of the proposal of the directorate and the approval of the Ministry in accordance with the health service planning." In this process, collective person transfers can now be made with the approval of the ministry.

In the event that there are no assistants to work in the unit, the unit can continue to serve for eight months with the assignment by the directorate, but if there are still no assistants at the end of eight

months, the rights arising from the institutional contract terminate.

Payments to the educational institution

The payments to the institution to be made by the Ministry are regulated in Article 7 of the last regulation. A notable innovation here is the mention of the payment to foundation universities. For EFHCs provided by foundation universities, no payments are made to instructors, assistants or family health personnel.

The money to be transferred to the institution by the ministry will be transferred to a subaccount in the revolving fund enterprises of the educational institution to be used only for this purpose. The first aim here is to prevent revolving fund deductions, and the second aim is to prevent the money transferred to the hospitals' revolving fund pools. This provision, which seems wise and logical in theory, has led to a number of problems in practice. The defensive attitude of the trustees and hospital revolving fund enterprises because they are not aware of or afraid of how to use this money has caused disruptions in meeting the needs of service units. In the same article, the fact that educational family health centers are a unit of educational institution providing field services seems to be a regulation that increases institutional ownership and responsibility.

In the payments to be made for assistants and family health personnel, it is also stated in this article that the salary and base supplementary payment will be made by the institution, whereas the encouragement payment will not be made. For instructors, encouragement payments are also made by the institution, taking into account the duration of their employment.

The use of fixed figures for the payments to the educational institution specified in the first paragraph of Article 7 of the regulation is contrary to the logic of the legislation. Indeed, it is clear that the figures will remain very low and insufficient in the coming years owing to inflation and the cost of living. Although these amounts are increased every 6 months by the ministry and deposited into the institutions' accounts, it would be more accurate to calculate this amount by indexing it to the ceiling wage, as in the Family Medicine Contract and Payment Regulation.

Payments to instructors, assistants and family health personnel

Within the scope of the white reform, new arrangements were made in the payments of physicians and health workers, and changes in payment methods led to the need for revision in this regulation; as a result, significant changes were made. The most marked change regarding the payments regulated in Article 8 of the regulation is that the disease management platform (DMP) has been made applicable to educational family health centers. Thus, the intermediate score for payment can now be increased up to one and a half times if residents perform certain screenings and follow-ups of patients registered in their units, and the score for payment is calculated in this way. Another important change is that the limit of 2800 people for the first eight months, after which up to 4000 people were included in the calculation, has been reduced to 2800, making it an encouraging incentive for the DMP.

Conclusion

As a result, with amendments and positive changes, as of December 2024, there are a total of 63 EFHCs and 195 educational family medicine units. However, the desired number of EFHCs has not yet been reached for reasons such as the hesitancy of the directorates and the lack of adoption of EFHCs by educational institutions. It is essential to take measures to facilitate the establishment and operation of EFHCs, which are the undeniable reality of the field training of family medicine

specialty training, and to open new units. Each EFHC or new unit to be opened will contribute to the reduction of ceiling populations in terms of increasing the quality of health services provided to citizens, reduce the burden on secondary and tertiary hospitals and prevent overcrowding, and ensure that family medicine assistants are ready to enter the field by understanding the operational structure of the family health centers where they will work after graduation and the profile of the patients or population they will encounter.

Author contribution

The authors declare contribution to the paper as follows: Review conception and design: BD, LA; literature review: BD, LA; draft manuscript preparation: BD. All authors reviewed the results and approved the final version of the article.

Source of funding

The authors declare the study received no funding.

Conflict of interest

The authors declare that there is no conflict of interest.

References

1. Allen J, Gay B, Crebolder H, et al. The European Definition of General Practice / Family Medicine Wonca Europe 2023 Edition. 2002.
2. Aile Hekimliği Uygulama Yönetmeliği. Available at: https://mevzuat.gov.tr/ (Accessed on January 20, 2025).
3. Ak M. Akademik bir disiplin olarak aile hekimliği. Journal of Turgut Ozal Medical Center. 2010;17(4):403-405.
4. T.C. Sağlık Bakanlığı, Tıpta Uzmanlık Kurulu. Tıpta Uzmanlık Kurulu Müfredat Oluşturma ve Standart Belirleme Sistemi, Aile Hekimliği Uzmanlık Eğitimi Çekirdek Müfredatı. 2019.
5. Apaydın KÇ, Uzuner A, Ünalan PC, Çifçili S, Akman M. Training Family Health Center Building Experience of Marmara University Medical School Department of Family Medicine. The Journal of Turkish Family Physician. 2017;8(1):15-22. **[Crossref]**
6. Aile Hekimliği Kanunu. Available at: https://www.mevzuat.gov.tr/ (Accessed on January 28, 2025).
7. Eğitim Aile Sağlığı Merkezleri Ödeme ve Sözleşme Yönetmeliği. Available at: https://www.resmigazete.gov.tr/ (Accessed on January 28, 2025).
8. Egici MT, Gökseven Y, Öztürk GZ, Esen ES, Toprak D. 'Educational Family Health Centers' in Family Medicine Resident Training Experience of Şişli Hamidiye Etfal Training and Research Hospital. Turkish Journal of Family Practice. 2019;23(4):165-175.
9. Eğitim Aile Sağlığı Merkezleri Yönetmeliği. Available at: https://mevzuat.gov.tr/ (Accessed on January 28, 2025).

Turk J Fam Pract 2025;29(1):41-43
DOI: 10.54308/TJFP.2025.823

Letter to the Editor

Employment of physiotherapists in primary care in Türkiye: Improving public health through first contact physiotherapy

Dilan Demirtaş Karaoba[1], Ramazan Cihad Yılmaz[1]

[1]Department of Physiotherapy and Rehabilitation, Faculty of Health Sciences, Iğdır University, Iğdır, Türkiye

Dear Editor,

It is an undeniable fact that we are an increasingly aging society. The aging population and sedentary lifestyle are associated with the more frequent occurrence of musculoskeletal problems, which further increase the demand for healthcare. Meeting the increasing demand for health services results in various difficulties in the provision of health services.[1] This increasing demand has led to the emergence of integrated rehabilitation activities and innovative rehabilitation approaches, which offer significant opportunities to meet the healthcare needs of the global population.[2] One of these innovative approaches is the provision of physiotherapy services in primary care.

Primary healthcare refers to the first contact of the patients with health professionals. In primary care, clinicians aim to provide integrated and accessible health services. The basis of primary care services is to reduce patient referrals to secondary and tertiary care. In order to achieve this goal, it is necessary to increase the accessibility of inclusive health services, and one of the efforts towards this is to increase the employment of non-physician health professionals in primary care. A feasibility study was also conducted on the employment of physiotherapists in primary care in our country. This study emphasized that primary care physiotherapy can provide protection from chronic diseases and support the treatment process.[3] Primary care physiotherapy is becoming increasingly important in the world. This model has achieved successful results in Italy, i.e., it helps to prevent the exacerbation of chronic conditions. There is evidence that it meets the health needs of individuals by providing rehabilitation opportunities in non-hospital environments.[4] Current evidence shows that individuals with musculoskeletal problems, in particular, prefer primary healthcare professionals, including general practitioners and physiotherapists, as their first point of contact. Biopsychosocial assessment and treatment methods practiced in primary care contribute to both reducing healthcare costs and improving people's quality of life.[5]

To implement global primary care physiotherapy services in our country, the employment of physiotherapists in this field should be increased. With the transition from traditional

✉ Ramazan Cihad Yılmaz ▪ fzt.yilmaz.cihad@gmail.com
Received: 10.01.2025 **Accepted:** 23.02.2025 **Published:** 26.03.2025

physiotherapy to extended-scope physiotherapy in the last 20 years, various countries (such as the United Kingdom, Canada, and Australia) have experienced significant progress in this regard. These new roles of physiotherapists have been considered an important initiative for public health development.[6-8] Thus, the dissemination of this model in our country may be beneficial in providing better healthcare. This situation can both reduce the density in hospitals and enable individuals in need of physiotherapy to receive more timely and cost-effective treatment at a place closest to them.

The treatment strategies applied by physiotherapists aim to (a) increase joint range of motion, (b) increase muscle strength and endurance, (c) increase stability, (d) reduce inflammation, and (e) reduce pain. To achieve these goals, physiotherapists implement personalized therapeutic exercise programs. Thermal modalities and electrotherapy agents can also be used when necessary. Health education can also be provided as part of the treatment to maximize and sustain the benefits to be obtained.[9] All these interventions can be carried out in primary care with appropriate planning.

Physiotherapists working in primary care play an important role in the management of individuals with chronic diseases. They also play a critical role in directing more complicated patients to interdisciplinary care.[10] Considering all these, there is a need for initiatives to improve public health through establishing healthy communication among family physicians, physiotherapists, other health professionals, and the patient (Figure 1). These initiatives will contribute to the development of primary care physiotherapy and will enable more people to meet their physiotherapy needs in a shorter time.

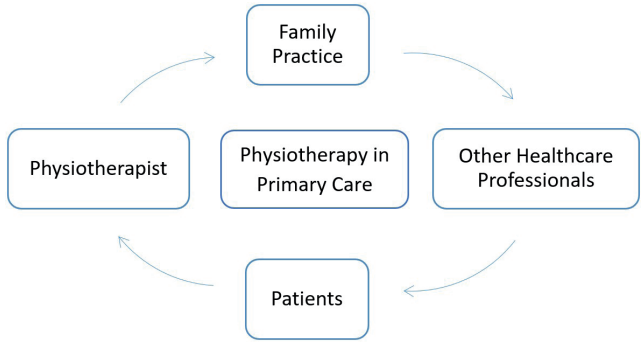

Figure 1. Roles contributing to the realization of primary care physiotherapy

Author contribution

The authors declare contribution to the paper as follows: Study conception and design: DDK, RCY; draft manuscript preparation: DDK, RCY. All authors reviewed the results and approved the final version of the article.

Source of funding

The authors declare the study received no funding.

Conflict of interest

The authors declare that there is no conflict of interest.

References

1. Stynes S, Jordan KP, Hill JC, et al. Evaluation of the First Contact Physiotherapy (FCP) model of primary care: patient characteristics and outcomes. Physiotherapy. 2021;113:199-208. **[Crossref]**
2. Gimigliano F, Negrini S. The World Health Organization "Rehabilitation 2030: a call for action". Eur J Phys Rehabil Med. 2017;53(2):155-168. **[Crossref]**
3. Timurtaş E, Avcı EE, Demirbüken İ, et al. Physiotherapist employment in primary health care: Feasibility research in İstanbul province. Sağlık Akademisyenleri Dergisi. 2021;8(1):8-13.

4. Da Ros A, Paci M, Buonandi E, Rosiello L, Moretti S, Barchielli C. Physiotherapy as part of primary health care, Italy. Bull World Health Organ. 2022;100(11):669-675. **[Crossref]**

5. Boyle EM, Evans K, Coates S, et al. Patient experiences of referral practices and primary care physiotherapy for chronic nonspecific low back pain. Physiother Theory Pract. 2024;40(6):1326-1342. **[Crossref]**

6. Desjardins-Charbonneau A, Roy JS, Thibault J, Ciccone VT, Desmeules F. Acceptability of physiotherapists as primary care practitioners and advanced practice physiotherapists for care of patients with musculoskeletal disorders: a survey of a university community within the province of Quebec. BMC Musculoskelet Disord. 2016;17(1):400. **[Crossref]**

7. McPherson K, Kersten P, George S, et al. A systematic review of evidence about extended roles for allied health professionals. J Health Serv Res Policy. 2006;11(4):240-247. **[Crossref]**

8. Bastiaens F, Barten DJ, Veenhof C. Identifying goals, roles and tasks of extended scope physiotherapy in Dutch primary care- an exploratory, qualitative multi-step study. BMC Health Serv Res. 2021;21(1):19. **[Crossref]**

9. Gallardo Vidal MI, Calleja Delgado L, Tenezaca Marcatoma JC, Calleja Guadix I, Daimiel Yllera A, Morales Tejera D. Physiotherapy and health education protocol in chronic musculoskeletal shoulder pain. Experience in Primary Care. Aten Primaria. 2022;54(5):102284. **[Crossref]**

10. van Dijk H, Köke AJ, Elbers S, Mollema J, Smeets RJ, Wittink H. Physiotherapists Using the Biopsychosocial Model for Chronic Pain: Barriers and Facilitators-A Scoping Review. Int J Environ Res Public Health. 2023;20(2):1634. **[Crossref]**

Turk J Fam Pract 2025;29(1):44-49
DOI: 10.54308/TJFP.2025.837

News

Observations from the European Young Family Doctor's Movement (EYFDM) Bosnia and Herzegovina Exchange Program

Aybike Güner Tunçez[1]

[1]Department of Family Medicine, Faculty of Medicine, Atatürk University, Erzurum, Türkiye

This year, within the scope of EYFDM (European Young Family Doctor's Movement), I had opportunity to participate in the Bosnia-Herzegovina exchange program that took place between 18.09.24-22.09.24. The program lasted 5 days, 2 days we observed family medicine in Bosnia-Herzegovina and 3 days we participated in a preventive health symposium. Bosnia-Herzegovina is a country governed by two separate entities as Federation and Serbian Entity. The exchange program took place in the city of Doboj in the Serbian Entity.

We participated in the exchange program as 4 colleagues from Türkiye, Dr. Şeyda Özcan Maden, Dr. Gizem Jülide Kalaycı and Dr. Aslınur Özmen from Türkiye and left as friends. We met colleagues from 6 different countries and made new friendships.

EYFDM Bosnia and Herzegovina representative Dr. Marina Jotic Ivanovic was in contact with us from the day the participants were selected. She hosted us in Doboj and organized the social and academic programs in the best way.

Day 1 Rural Family Medicine Observation

On the first day we had the opportunity to observe rural family medicine services. One group was guided by Dr. Aleksandra Lazica and the other by Dr. Milena Bilic and they explained the rural family medicine system in Bosnia.

We traveled with Dr. Milena Bilic to Osjecani Donji, a village of about 2000 inhabitants, 20 km from Doboj. There is a family medicine unit in this village, run by 2 doctors and 2 nurses.

✉ Aybike Güner Tunçez ▪ aybike.guner@saglik.gov.tr
Received: 02.03.2025 **Accepted:** 04.03.2025 **Published:** 26.03.2025

The first day we arrived in Doboj, there was an internet outage throughout the city. For this reason, when we asked how they keep patient records, prescription and referral system, they told us that they keep patient records on paper because they have internet problems from time to time. However, they also use computerized procedures such as patient registration, examination, treatment, prescription and referral. There are e-prescription systems in the country.

Our observation of rural family medicine under the exchange program also covered in the local press.

07:00 am-02:00 pm and 02:00 pm-07:00 pm, two different doctors work in this family medicine unit. They give appointments to 6 patients per hour. They work with an appointment system, but Dr. Bilic says that there is no restriction; every patient can come every day, there is no limitation at this point.

The referral system for family physicians in rural areas is active and fast. A referred patient can be examined in the relevant department within 4-5 days, for example, a patient referred for colonoscopy is treated in 10 days at the latest. Patients can go to a higher level of care without the referral system, but they have to pay a significant amount of money, and Dr. Bilic said that patients can pressure for a referral.

Family medicine services in rural areas function similarly to the emergency green area in Turkey. In the observation area where patients receive parenteral treatments, antibiotics, diuretics, analgesics and antipyretics are available.

Dr. Bilic emphasized that we are a society with a high demand for antibiotics and parenteral treatment, which was a familiar situation for the participants from Türkiye.

In Bosnia, there is also a pharmacy among the institutions providing health services in general. This is how patients obtain their prescribed medicines.

After the observation of rural family medicine, we visited the historical and archaeological museum of Doboj with a guide. This trip reminded us once again how close the Balkan culture is to us.

For the evening Marina and her friends organized a dinner at a beautiful vineyard restaurant. We reached the restaurant through quiet and forested villages. We finished the evening with Kolo, the local Bosnian dance with lots of laughs and conversations.

Day 2 Secondary Family Medicine Observation in Dom Zdravlja Doboj

On the second day Dr. Marina and her friends Dr. Sladana, Dr. Zeljka, Dr. Zagorka accompanied us to the health center. The Health Center is a secondary care hospital with several specialties such as emergency, pediatrics, internal medicine, epidemiology. There are 21 family medicine specialists and 3 doctors in training in family medicine.

Nurses greet patients and open a record by categorizing them according to the reason for their application and a detailed record appears on the doctor's screen. If the patient has come to prescribe medication for chronic diseases, the name and dosage of the medication are displayed on the physician's screen, and if the physician deems it appropriate, the patient can take the prescription from the nurse and leave. In this center, family medicine specialists can actively use methods such as spirometry and ultrasonography. Cancer screenings were carried out in certain months, for example, nurses were conducting patient interviews because breast cancer screenings were scheduled for the following month.

In Bosnia, pregnancy follow-up, infant follow-up, child follow-up and vaccination practices are not carried out in family physicians. Examination, follow-up and vaccinations of the 0-6 age group are followed up in the pediatric clinic. Vaccinations after the age of 7 are followed up in the epidemiology department. The entire pregnancy process is monitored by gynecology.

In Bosnia, patients are registered with a family physician, an obstetrician, a gynecologist and a pediatrician at certain times of the year. The management of follow-ups, vaccine management and registration with a specific physician in specialties other than family medicine are different from Turkey.

When we ask about the cost of health care, Dr. Marina informs us. Up to the age of 7 examinations are free of charge, but from the age of 15 onwards there is a small fee for health care. In the Federation there is a small fee for each medicine, while in the Serbian entity there is only a fee for certain specific medicines.

After the observation, we took a walk to Doboj castle. Once we climbed the castle, the conversations continued against the view.

Day 3 Preventive Medicine Symposium

The 4th medical symposium was inaugurated. The ceremony started energetically with local music. The opening of the symposium was also covered by the local press.

Day 4 Banja-Luka Excursion

Before the gala dinner, we took a trip to Banja-Luka, the capital of the Serbian entity. Salma and Libby were very enthusiastic about this trip, and my wife and I couldn't miss it. We had a nice tour of the city, a delicious closing with Bosnian answers, and then we drove about an hour back to Doboj.

We had a very colorful and beautiful evening as the EYFDM team at the gala dinner. Months in advance, Marina had shown great kindness by asking everyone's food sensitivities and preferences. After our dinner, we ended the night with music and dancing. The famous artists of the country also added color to the night.

Day 5-EYFDM Session

Eleven physicians from 7 different countries (Portugal, UK, Sweden, Türkiye, Bosnia and Herzegovina, Bangladesh, Pakistan) made presentations on primary healthcare services. The session enabled us to learn about the primary healthcare services of different countries and to realize the strengths and shortcomings. It was a good session that helped us to look at primary healthcare services from a much broader perspective.

Marina came up with the idea of everyone bringing their own country's famous desserts, and after the EYFDM session, our dessert table from all over the world was organized. At this colorful table, desserts were eaten and conversations were had that we will always cherish.

Conclusion

It was a very social program with plenty of cultural interactions as well as academic aspects such as reminding the importance of primary health care services and opening horizons for the development of these services. We made brand new friendships, and for many of us it was a brand new experience that will be considered a milestone in our lives. I would recommend this experience, which I will always remember with excitement, to all my colleagues.

References

1. European Young Family Doctors Movement (EYFDM). History. 2024. Available at: https://eyfdm.eu/about/history (Accessed on February 25, 2025).
2. Museum of Doboj. History. Available at: https://museums.eu/museum/details/291/regional-museum-of-doboj (Accessed on February 25, 2025).
3. 4. Simpozijum Doktora Medicine, Doboj 2024. Available at: https://domzdravlja.ba/2024/09/ (Accessed on February 25, 2025).